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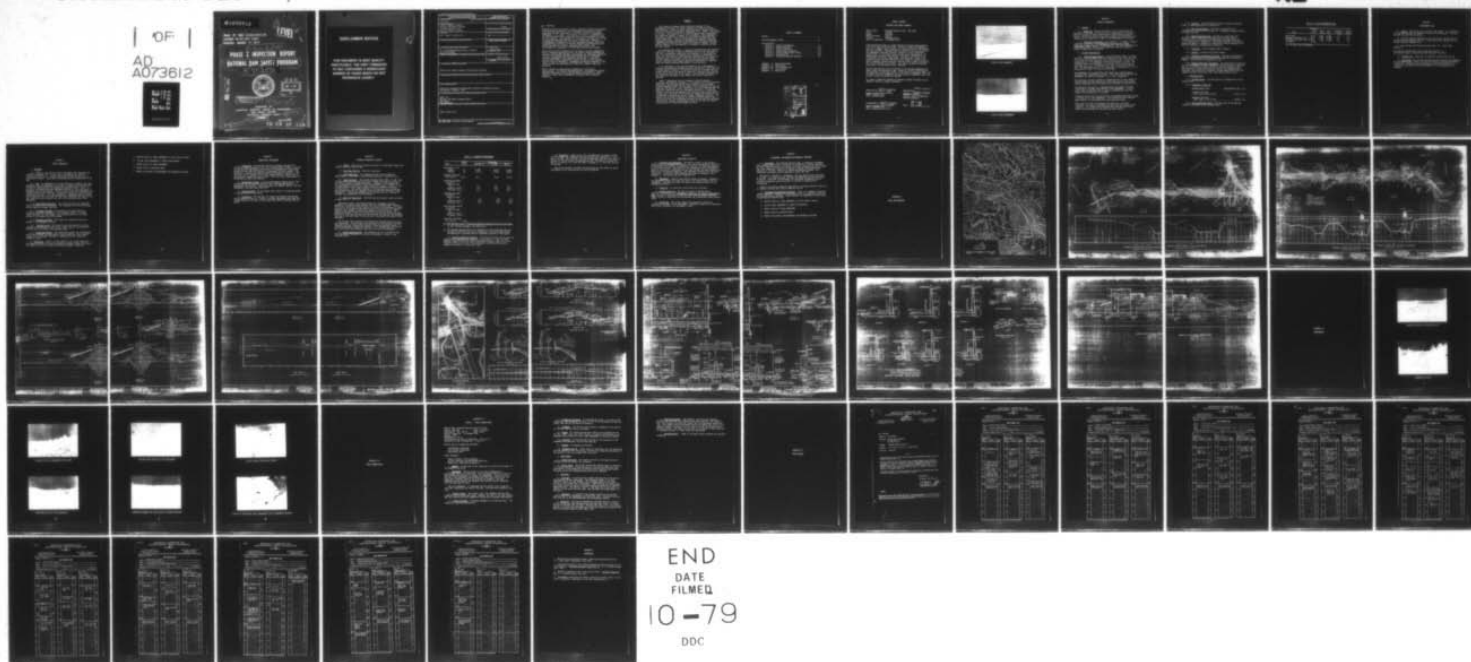
NATIONAL DAM SAFETY PROGRAM. DIASCUND RESERVOIR DAM. INVENTORY --ETC(U)

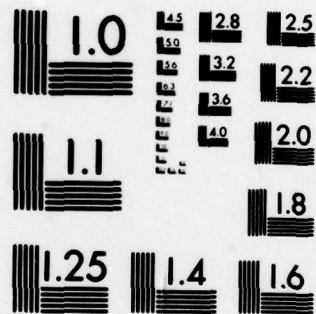
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MICROCOPY RESOLUTION TEST CHART  
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Name Of Dam: DIASCUND RESERVOIR DAM

Location: NEW KENT COUNTY, VIRGINIA

Inventory Number: VA-12703

LEVEL

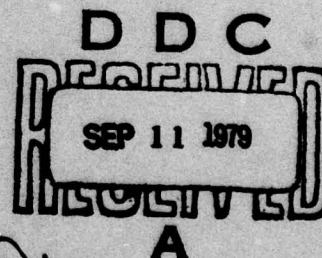
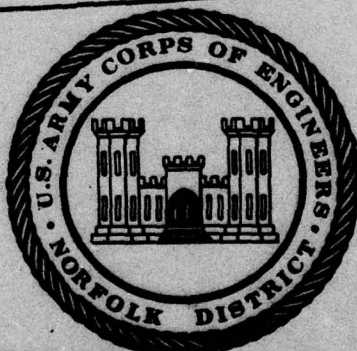
10 James A. Welsh

## PHASE I INSPECTION REPORT

# NATIONAL DAM SAFETY PROGRAM

Diascund Reservoir Dam. Inventory  
Number: VA-12703. New Kent County,  
Virginia. Phase I Inspection Report.

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PREPARED BY

NORFOLK DISTRICT CORPS OF ENGINEERS

803 FRONT STREET

NORFOLK, VIRGINIA 23510

MAR 1979

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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.



## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I REPORT

NATIONAL DAM SAFETY PROGRAM

Name of Dam: Diascund Reservoir Dam #VA 12703  
State: Virginia  
County: New Kent  
USGS Quad Sheet: Walkers  
Stream: Diascund Creek  
Date of Inspection: 14 December 1978

Diascund Reservoir Dam is a zoned earthfill structure approximately 5,510 feet long and 34 feet high. The dam is owned and operated by the city of Newport News, Virginia, and supplies water to the Newport News Water System. A pumping station located on the left portion of the embankment furnishes raw water through a 42 inch reinforced concrete pipe to filtration plants several miles downstream in the Newport News, Virginia Water System. The dam is classified as an intermediate size with a high hazard classification. There is an ungated concrete spillway (250 feet crest length at elevation 26.0) and an emergency earthen spillway (300 feet crest length at elevation 28.0 with 10 percent side slopes). The dam is located on Diascund Creek about 1/2 mile north of U.S. Route 60.

The two spillways will pass 72 percent of the Probable Maximum Flood (PMF) without overtopping the dam. Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the spillways are rated inadequate, but not seriously inadequate since they do pass at least 50 percent of the PMF.

The visual inspection revealed no apparent problems and there are no immediate needs for remedial measures.

Original signed by  
Submitted By: JAMES A. WALSH

JAMES A. WALSH, P.E.  
Chief, Design Branch

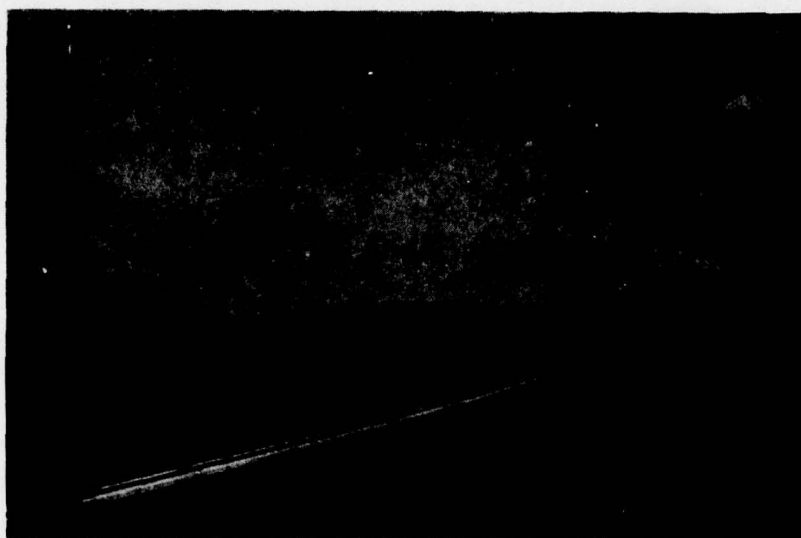
Original signed by  
Recommended By: ZANE M. GOODWIN

ZANE M. GOODWIN, P.E.  
Chief, Engineering Division

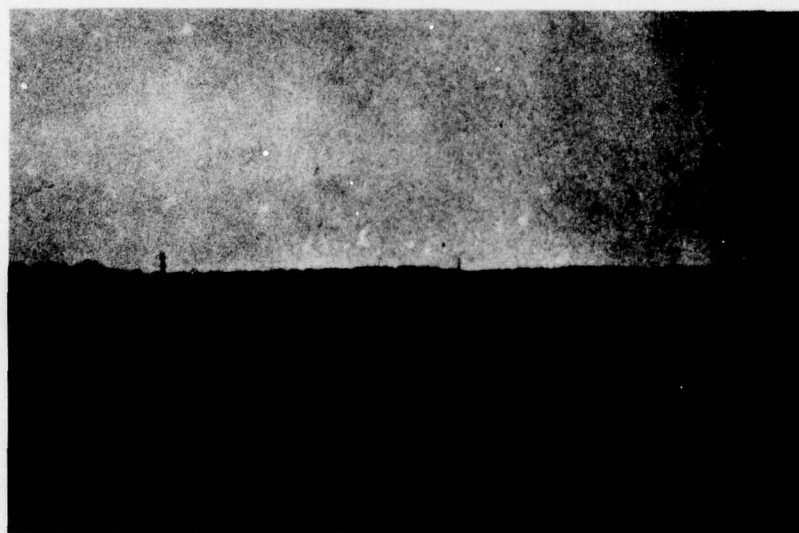
Original signed by:  
Approved By: Douglas L. Haller

DOUGLAS L. HALLER  
Colonel, Corps of Engineers  
District Engineer

MAR 13 1979  
Date: MAR - 3 1979



VIEW OF LEFT EMBANKMENT



VIEW OF RIGHT EMBANKMENT

## SECTION 1

### PROJECT INFORMATION

#### 1.1 General:

1.1.1 Authority: Public Law 92-367, 8 Aug 72 authorized the Secretary of the Army, through the Corps of Engineers to initiate a national program of safety inspections of dams through the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams (Appendix V, Reference 4). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

#### 1.2 Project Description:

1.2.1 Dam and Appurtenances: Diascund Reservoir Dam is a zoned earthfill structure about 5,510 feet long and 34 feet high. The crest of the dam is 36 feet wide and is at elevation 34.42. A road that transverses the left embankment raises the elevation to 34.82. The upstream slope is 3 horizontal to 1 vertical (3H:1V) from crest to elevation 16.0, 5.5:1 to elevation 12.0 and 5:1 to the heel of the dam. The downstream slope is 3:1 from crest to elevation 14.0, 4:1 to elevation 8.0, and 3:1 to the toe of the dam.

The embankment has an impervious core keyed into a marine deposit formation and a foundation toe drain. Plan views and profiles of the embankment are shown on Drawings 2, 3, 4, and 5, Appendix I.

The principal concrete spillway is ungated and has a crest length of 250 feet with the crest elevation at 25.0 and vertical side slopes. Wooden flashboards raise the crest of the spillway to elevation 26.0.

The emergency spillway is a vegetated earth side-channel spillway located on the extreme right portion of the embankment. It has a crest length of 300 feet with a crest at elevation 28.0 and side slopes of 10 horizontal to 1 vertical.

A pumping station that supplies water to the Newport News Water System is located on the left embankment. The bricked structure contains pumps capable of discharging 30 million gallons per day.

Two 4-foot by 6-foot sluice gates with invert at a low level (elevation 1.0) permits withdrawal of water from the bottom of the reservoir. The sluice gates discharge into an 8-foot by 10-foot tunnel running through the dam below the pump station.



1.2.2 Location: Diascund Reservoir Dam is located on Diascund Creek, 1/2 mile upstream of U.S. Route 60.

1.2.3 Size Classification: The dam is classified as an "intermediate" size structure because of its maximum storage potential of 18,000 acre-feet.

1.2.4 Hazard Classification: The dam is located 1500 feet upstream of four houses and is therefore given a high hazard classification in accordance with guidelines contained in Section 2.1.2 of Reference 4, Appendix V. The hazard classification used to categorize dams is a function of location only and has nothing to do with its stability or probability of failure.

1.2.5 Ownership: City of Newport News, Virginia.

1.2.6 Purpose: Recreation and water supply.

1.2.7 Design and Construction History: The dam was designed by Malcolm Pirnie Engineers and constructed by Carpenter Construction Company. Construction was completed in 1963.

1.2.8 Normal Operational Procedures: The pump station located on the left embankment can pump a maximum 30 million gallons of raw water per day to filtration plants operated by the city of Newport News. This operation is used during dry periods and high demand periods. Otherwise, the operation is automatic, passing excess flows over the ungated spillway as the pool level rises above elevation 26.0.

### 1.3 Pertinent Data:

1.3.1 Drainage Areas: The dam controls a drainage area of 43.5 square miles.

#### 1.3.2 Discharge at Dam Site:

Maximum Known Flood. . . . . Approximately 825 c.f.s.

##### Principal Spillway

Pool level at top of dam . . . . . 20,157 c.f.s.

##### Emergency Spillway

Pool level at top of dam . . . . . 20,740 c.f.s.

1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:



Table 1.1 DAM AND RESERVOIR DATA

Item	Elevation	Area, acres	Acre- feet	Watershed, Inches	Length, miles
	feet, m.s.l.				
Top of dam	34.82	2,680	18,000	7.8	6.2
Emergency spillway crest	28.0	1,560	14,300	6.2	4.9
Principal spillway crest (a)	26.0	1,340	12,200	5.3	3.8
Streambed	0.0+	-	-	-	-

(a) At top of the flashboards.

## SECTION 2

### ENGINEERING DATA

2.1 Design: Design data was provided by the owners. No information was available through the designers, Malcolm Pirnie Engineers. The data reviewed included the following.

a. As-built drawings indicating plans, elevations, and sections of the dam and appurtenant structures. Also shown on the drawings are test boring locations, Appendix III.

b. Test borings by Froehling and Robertson, Inc., March 1960, Appendix V.

No stability calculations, soil and geology reports, or hydrologic/hydraulic calculations were available for review.

2.2 Construction: There were no available construction records.

2.3 Evaluation: The as-built drawings and test borings were adequate. No construction reports were available to evaluate construction methods or alterations. However, as-built drawings were available during the inspection, and external structures appear to be in accordance to the drawings.

SECTION 3  
VISUAL INSPECTION

3.1 Findings:

3.1.1 General: The results of the 14 December 1978 inspection are recorded in Appendix III. At the time of the inspection, the pool elevation was 26.0 m.s.l. Ground conditions were wet and soft due to recent moist weather. There were no recorded previous inspections of the dam.

3.1.2 Dam: The embankment is in good condition. However, the right embankment, and the emergency spillway and its immediate downstream area are heavily vegetated with tall grass and coniferous trees. Also, a portion of the downstream right embankment abutting the left side of the emergency spillway has eroded. Vehicle access to the right embankment was prohibited due to wet conditions. Access was limited to a half-mile hike through mud and water. The left embankment is landscaped and has several trees planted by the city along the road that transverses the crest of the dam. Some trees were recently cut down on the upstream slope of the embankment.

3.1.3 Appurtenant Structures: The intake structure was submerged which inhibited visual observation. The discharge outlet below the pump station appeared in good condition.

3.1.4 Principal Spillway: The spillway is in good condition, including the wooden flashboards. The discharge channel is in good condition except for some damage to two concrete panels on the right portion of the channel due to settlement.

3.1.5 Emergency Spillway: Tall grass and coniferous trees were growing in the emergency spillway.

3.1.6 Reservoir Area: The reservoir area had some minor erosion upstream of the dam due to wave action. Small recently cut trees were floating near the riprap on the upstream slope.

3.1.7 Downstream Channel: The downstream channels for the drawdown outlet and principal spillway appear in good condition. The discharge channel of the emergency spillway is overgrown with tall grass and coniferous trees.

3.2 Evaluation: Overall the dam appears to be in good condition. The inspection revealed certain preventive maintenance items which should be schedule as part of an annual maintenance program. These are:



- a. Improve access to right embankment to allow vehicle access.
- b. Include right embankment in regular maintenance.
- c. Repair erosion of right embankment.
- d. Remove trees in upstream riprap.
- e. Remove tree growth from embankment and emergency spillway.



SECTION 4  
OPERATIONAL PROCEDURES

4.1 Procedures: The Diascund Reservoir provides raw water for filtration plants operated by the city of Newport News, Virginia. During dry periods and high demand periods water is withdrawn up to 30 million gallons per day from the reservoir to supplement the water supply. The reservoir is normally maintained between elevations 20.0 feet m.s.l. and 26.0 feet m.s.l.; however, this is not always possible. Excess flow is automatically passed over the spillway. Two 4 by 6 foot sluice gates can be operated to drain the reservoir.

4.2 Maintenance of Dam: A routine maintenance program has not been established for the Diascund Reservoir Dam, although some periodic maintenance has occurred. Large trees have been removed recently from the embankment's upstream slope protection.

4.3 Warning System: At the present time, there is no warning system or evacuation plan in operation.

4.4 Evaluation: The dam does not require an elaborate operational and maintenance procedure. However, an annual maintenance and inspection program should be initiated to help detect and control problems that may occur.

## SECTION 5

### HYDRAULIC/HYDROLOGIC DESIGN

5.1 Design: There are no original hydraulic or hydrologic design data available for the Diascund Dam.

5.2 Hydrologic Records: None were available.

5.3 Flood Experience: The maximum observed flood reached was approximately 1 foot high in the principal spillway or elevation 27.0.

5.4 Flood Potential: The Probable Maximum Flood (PMF), 1/2 PMF, and 100-Year Flood were developed and routed through the reservoir by use of the HEC-1DB computer program (Reference 1, Appendix V) and appropriate unit hydrograph, precipitation, and storage-outflow data. Clark's Tc and R coefficients for the local drainage area were estimated from basin characteristics. The rainfall applied to the developed unit hydrograph was obtained from the U.S. Weather Bureau Publications (Reference 2 and 3, Appendix V). Losses were estimated at an initial loss of 1 inch and a constant loss thereafter of 0.15 inch/hour.

5.5 Reservoir Regulation: Pertinent dam and reservoir data are shown in Table I.1.

Regulated releases from Diascund Reservoir supplement raw water demands to filtration plants owned by the city of Newport News, Virginia. Two 20-inch reinforced concrete pipes allow water to discharge at an invert elevation 31.0 through the dam and flow into a 42-inch pipe that supplies Harwood's Mill Reservoir and Lee Hall Reservoir with raw water. The maximum withdrawal of water for filtration is 30 million gallons per day. Water also flows past the dam over the principal spillway and the emergency spillway in the event water in the reservoir rises above the crests of the spillways.

The storage curve supplied by the owners was extended above the top of the flashboards. Rating curves were developed for the principal spillway, emergency spillway, non-overflow section of dam, and drawdown outlet. In routing hydrographs through the reservoir, it is assumed that the initial pool level was at the principal spillway crest (top of flashboards).

5.6 Overtopping Potential: The probable rise of the reservoir and other pertinent information on reservoir performance is shown in the following table:

**Table 5.1 RESERVOIR PERFORMANCE**

Item	Normal Flow	Hydrograph		
		100-Year <sup>1/</sup>	1/2 PMF	PMF <sup>2/</sup>
Peak flow, c.f.s.				
Inflow	44	16,384	35,513	71,026
Outflow	44	11,374	35,376	70,900
Maximum elevation, ft., m.s.l.	26.0	30.1	33.41	35.90
Principal spillway (el 26.0)				
Depth of flow, ft.	-	4.1	7.41	9.9
Duration, hours	-	5.8	12.0	12.4
Velocity, f.p.s.	-	6.7	9.0	10.4
Emergency Spillway (el 28.0)				
Depth of flow, ft.	-	2.1	5.41	7.9
Duration, hours	-	14.0	18.0	22.0
Velocity, f.p.s.	-	4.3	7.0	8.4
Non-overflow section (el 34.82)				
Depth of flow, ft.	-	-	-	1.1
Duration, hours	-	-	-	4.0
Velocity, f.p.s.	-	-	-	3.1
Tailwater elevation, ft., m.s.l.	3.0+	-	-	-

<sup>1/</sup> The 100-Year Flood (1 percent Exceedence Frequency Flood) has one chance in 100 of being exceeded in any given year.

<sup>2/</sup> The Probable Maximum Flood is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

**5.7 Reservoir Emptying Potential:** Two 4-foot by 6-foot sluice gates are available for dewatering the reservoir to elevation 1.0. The low level opening through the dam will permit withdrawal of about 1,389 c.f.s. with reservoir level at the crest of the principal spillway and essentially dewater the reservoir in less than 7 days.



5.8 Evaluation: Based on the size (intermediate) and hazard classification (high) the recommended Spillway Design Flood appropriate to this dam is the PMF. The principal spillway and emergency spillway will pass 72 percent of the PMF without overtopping the dam. The PMF will overtop the dam for a duration of 4 hours and reach a maximum of 1.1 feet over the top of the dam.

Conclusions pertain to present day conditions and the effect of future development on the hydrology has not been considered.



## SECTION 6

### STRUCTURAL STABILITY

6.1 Foundation and Abutments: The dam is located in the Atlantic Coastal Plain of Southeastern Virginia. The area soils generally consist of Pliocene-Holocene Columbia Group deposits overlying the Yorktown Formation of the Miocene series. The profile of the foundation varies considerably. Based on the as-built elevations and the test borings, the dam foundation is keyed into the Yorktown Formation. The abutments are keyed into the overlying soils. Profiles of the foundation are shown on Drawings 2 and 3, Appendix I. The boring logs are in Appendix IV.

6.2 Embankment: Based on the profiles shown on Drawing 4, Appendix I, the embankment consist of sandy soil with a core material keyed into the foundation. Available data does not specify the characteristics of the embankment materials.

6.3 Stability: No stability calculations were available.

6.4 Seismic Stability: The dam is located in Seismic Zone 1. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margins exist.

6.5 Evaluation: The visual inspection revealed no evidence of instability or stress of the embankment. Therefore, based on the inspection and as-built drawings, the dam appears stable.

## SECTION 7

### ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

**7.1 Assessment:** The Diascund Reservoir Dam, as observed 14 December 1978, appears sound without indication of instability or unsafe operation. Available engineering data was limited to as-built drawings and test borings. The visual inspection uncovered no apparent problems that threaten the integrity of the dam. There is no regular maintenance program. The operational procedures provide measures to drain the lake.

Reference 4, Appendix V, recommends a Spillway Design Flood equivalent of the PMF. Since the principal spillway and emergency spillway pass only 72 percent of the PMF, the spillways are considered inadequate, but not seriously inadequate since 50 percent of the PMF is passed without overtopping.

Based on the visual inspection and review of existing records, there are no apparent problems that require immediate action.

**7.2 Recommendations/Remedial Measures:** There is no immediate need for remedial measures. However, the following actions are suggested and should be initiated within 12 months. These measures are suggested for monitoring and maintenance purposes only.

- a. Improve access to right embankment to allow vehicle access.
- b. Include right embankment in regular maintenance.
- c. Repair erosion of right embankment.
- d. Remove trees in upstream riprap.
- e. Remove tree growth from embankment and emergency spillway.

**APPENDIX I**  
**MAPS AND DRAWINGS**





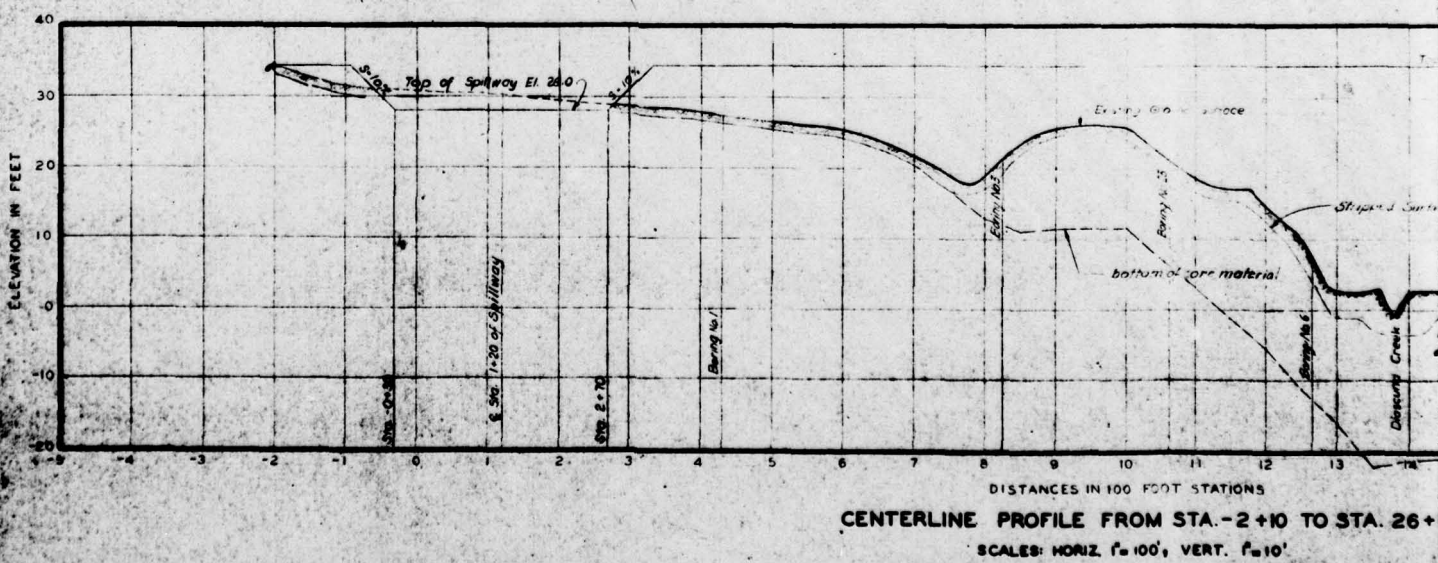
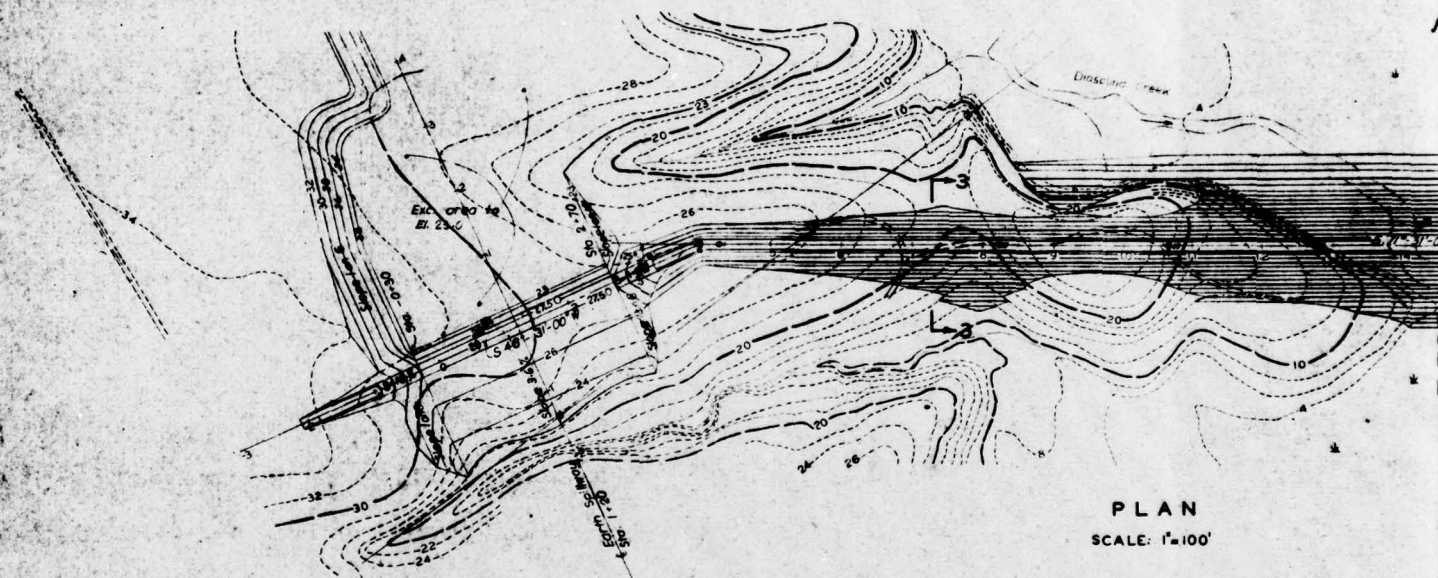
# LEGEND

Original Ground Contours & existing Structures  
 Final Ground Contours & new Structures  
 Boring  
 Paved Road & Gravel Shoulder  
 Power Pole Line  
 Fence  
 Marsh



# NOTES

1. For continuation of Spillway Grading see Sht. # 7
2. Indicated contours are at 2 foot intervals
3. Log of borings may be obtained from the Engineer or at the Dept. of Public Utilities Office
4. For Section 2-2/3-3 see Sht. # 4
5. For Section 4-4 see Sht. # 5
6. For Road Profile see Sht. # 5
7. Place 2 extra delineator posts with chain across roadway

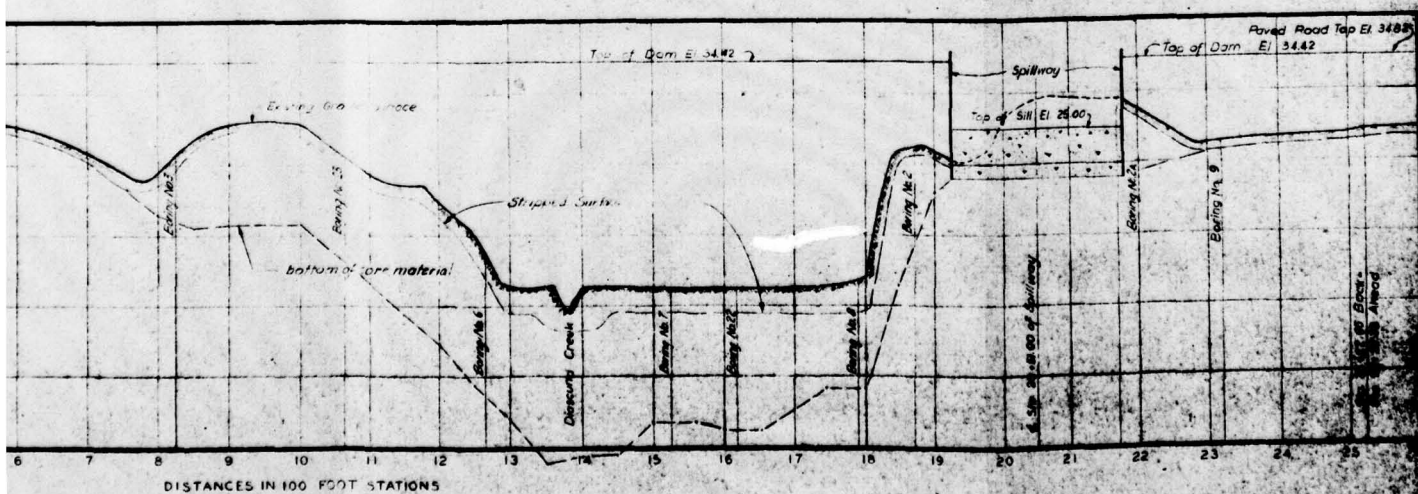
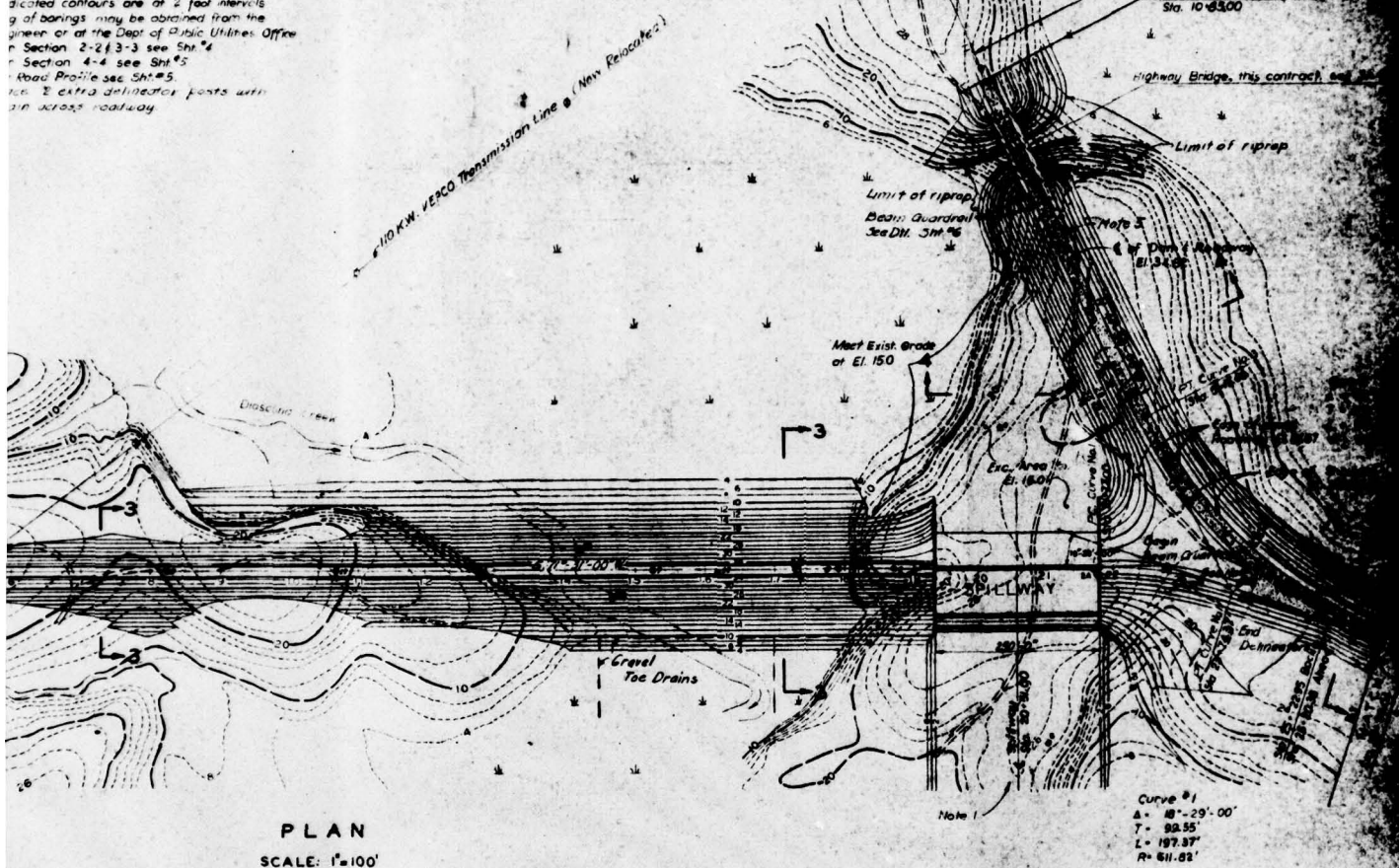


CITY OF NEW YORK  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER SUPPLY



# NOTES

Continuation of Spillway Grading  
 Sht. # 7  
 Elevation contours are at 2 foot intervals  
 Elevation of barings may be obtained from the  
 engineer or at the Dept. of Public Utilities Office  
 Section 2-213-3 see Sht. # 4  
 Section 4-4 see Sht. # 5  
 Road Profile see Sht. # 5  
 Note: Extra delineator posts will  
 be placed across roadway



CENTERLINE PROFILE FROM STA. -2+10 TO STA. 26+00

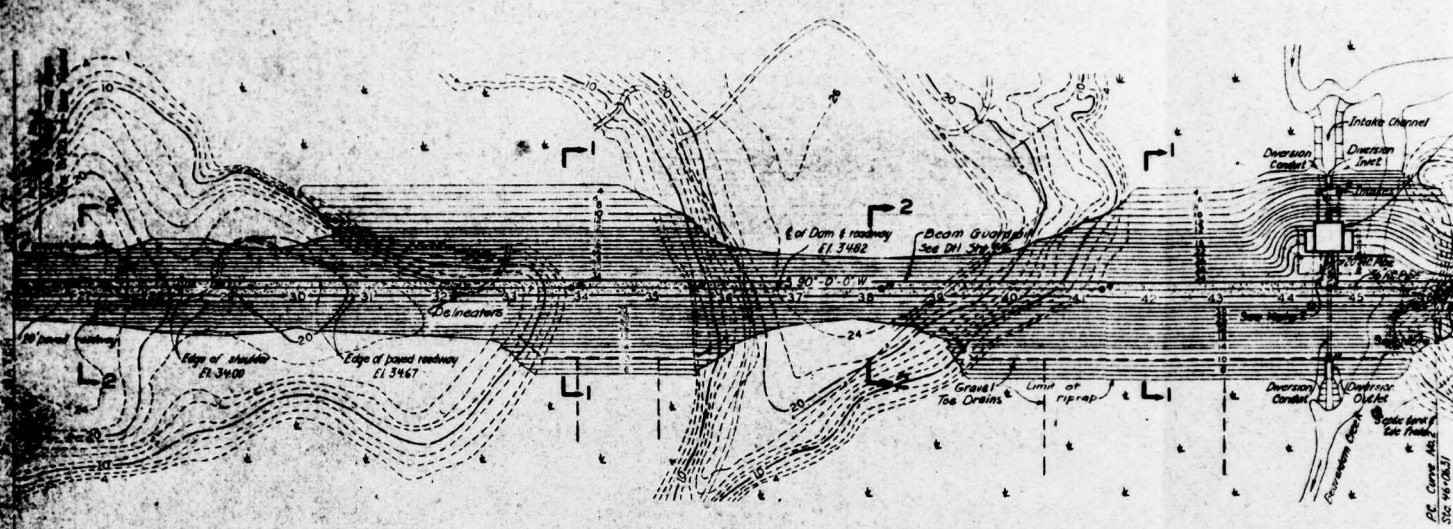
SCALE: HORIZ. 1"=100', VERT. 1"=10'

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CITY OF NEW YORK  
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 DIVISION OF WATER SUPPLY  
 ENGINEERING SECTION

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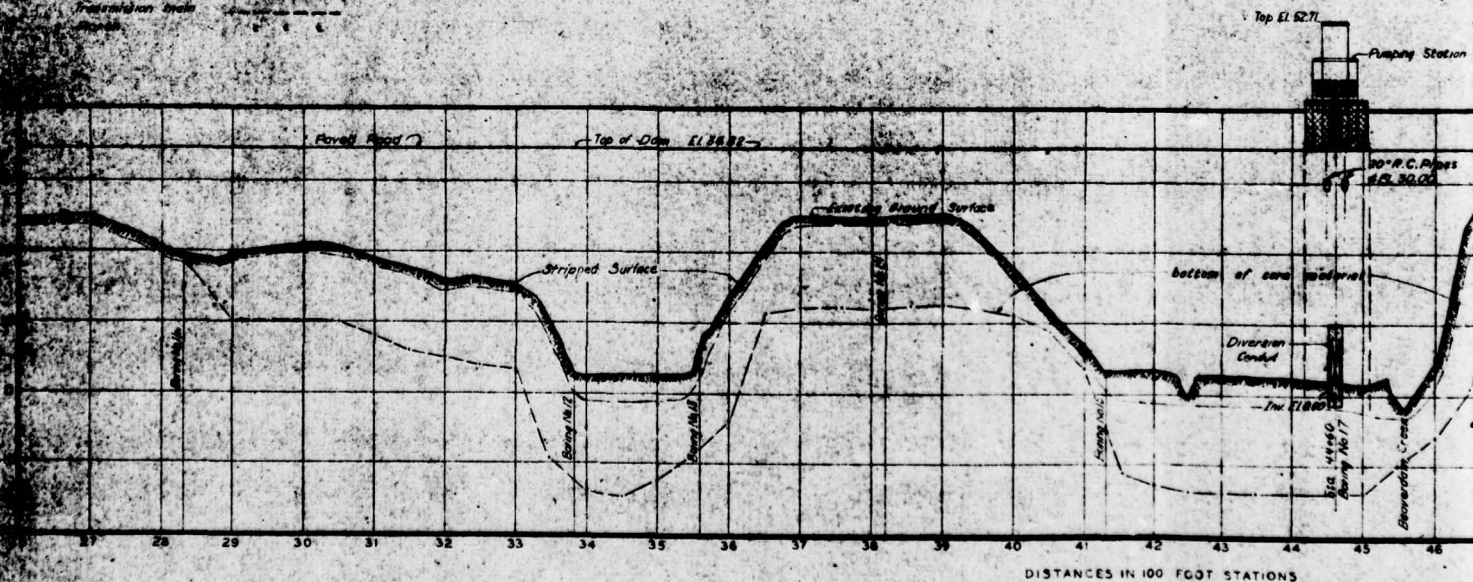
# LEGEND

Original ground contours	—
Existing structures	—
Final ground contours & new structures	—
Boring	o
Paved road & gravel shoulder	—
Manhole	o
Proposed pipe & line	—
Gravel toe drain	—
Structure	—
Stream	—
Transmission line	—

# NOTES

1. For location details of structures adjacent to Pumping Station see Sht. # 10 for Gen'l Section through Pumping station see Sht. # 11
2. All transmission main piping by others
3. Indicated contours are at 2 foot intervals
4. Log of borings may be obtained from the Engineer or at the Dept. of Public Utilities Office
5. For Section 1-1 & 2-2, see Sht. # 4

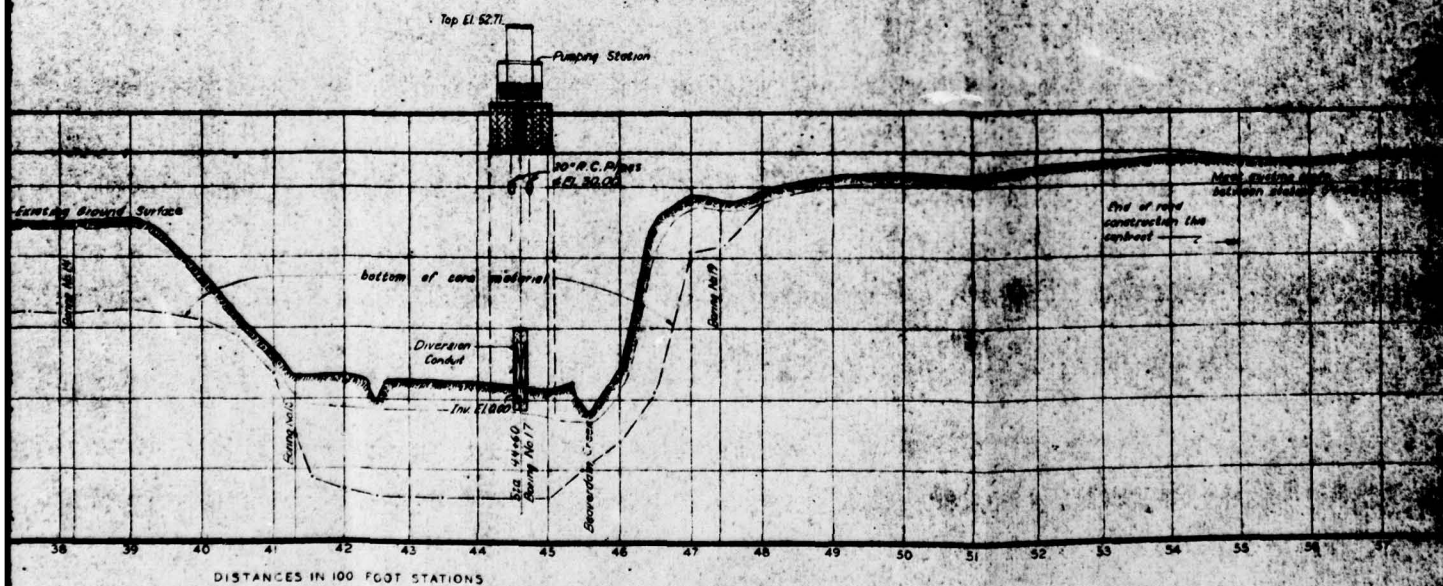
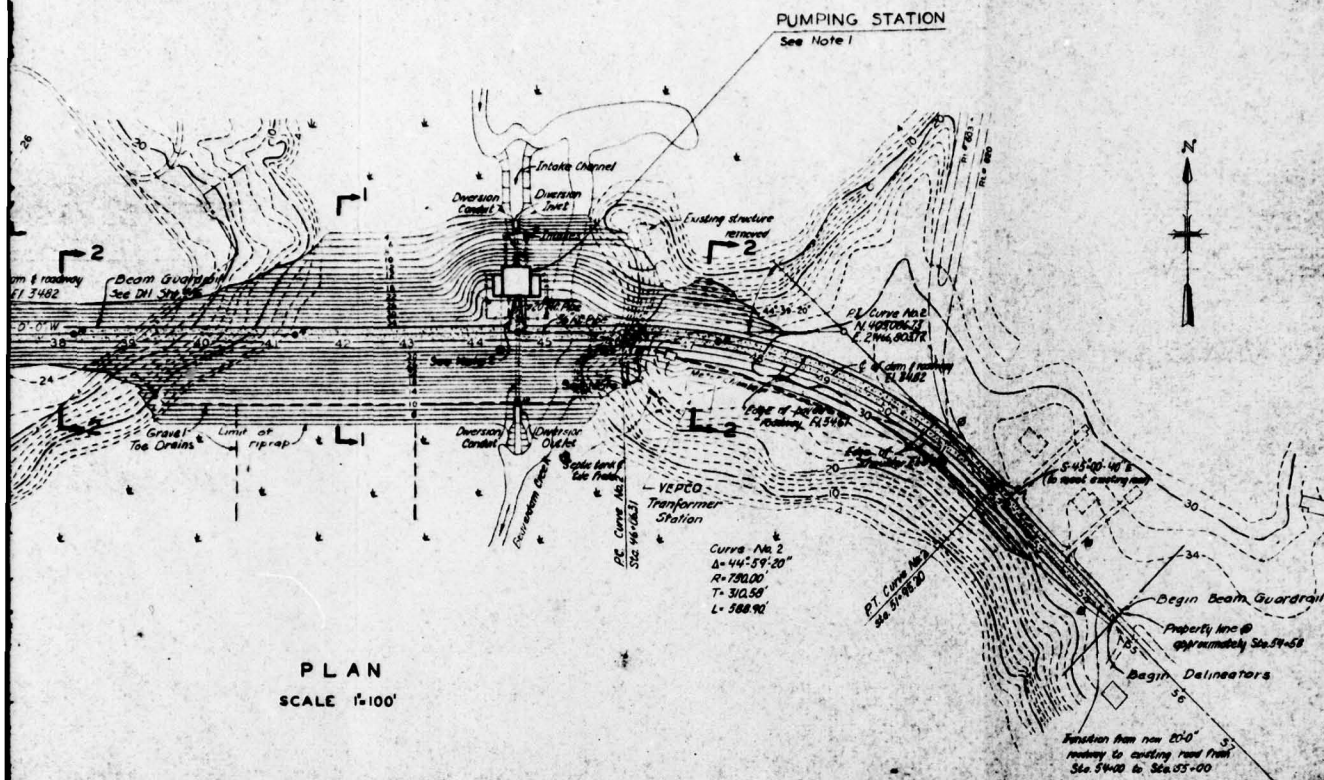
PLAN  
SCALE 1"=100'



CENTERLINE PROFILE FROM STA. 26+00 TO STA. 58+00  
SCALE: HORIZ. 1"=100', VERT. 1"=10'

APPROVED AS SHOWN BY ENGINEER A.P.L.

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DAMSCOURT WATER PROJECT  
DIAMOND DAM



CENTERLINE PROFILE FROM STA. 26+00 TO STA. 58+00

SCALE: HORIZ. 1"=100', VERT. 1"=10'

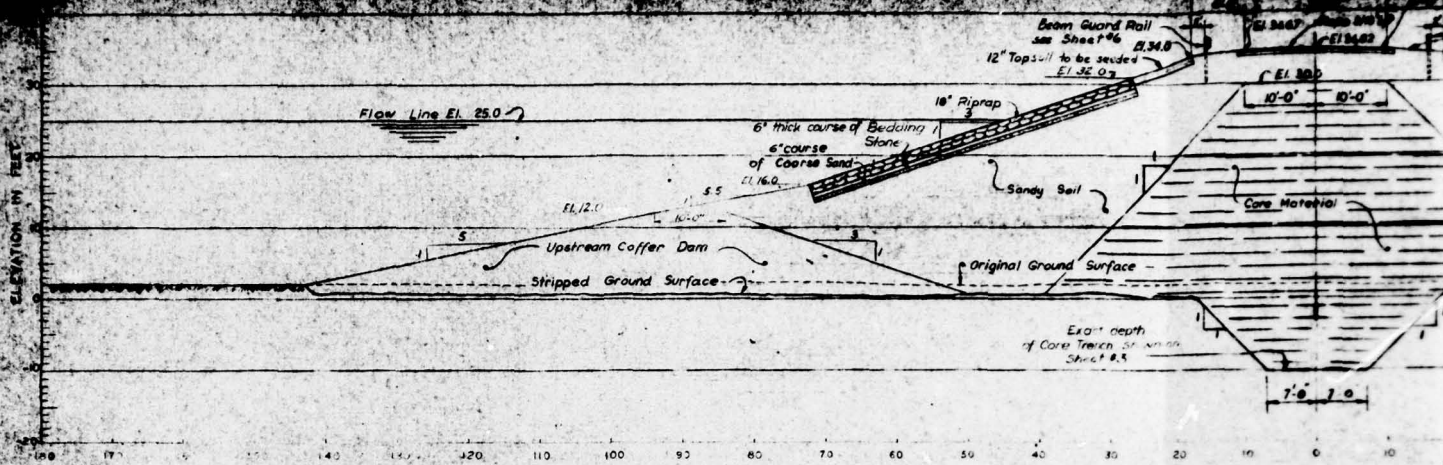
"AS BUILT"

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DIASCUND WATER PROJECT  
DIASCUND DAM

DAM  
PLAN AND CENTERLINE PROFILE

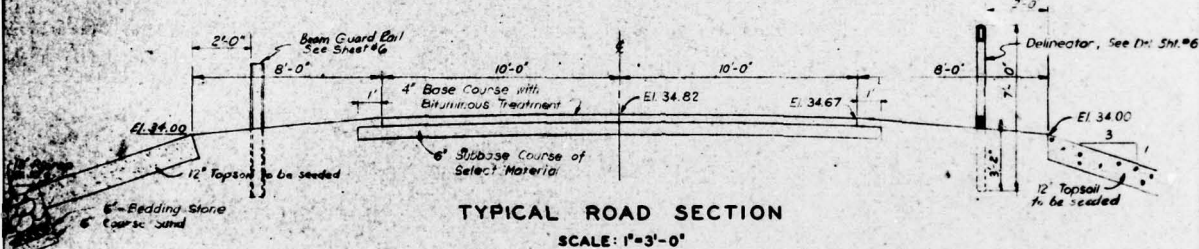
CONTRACT



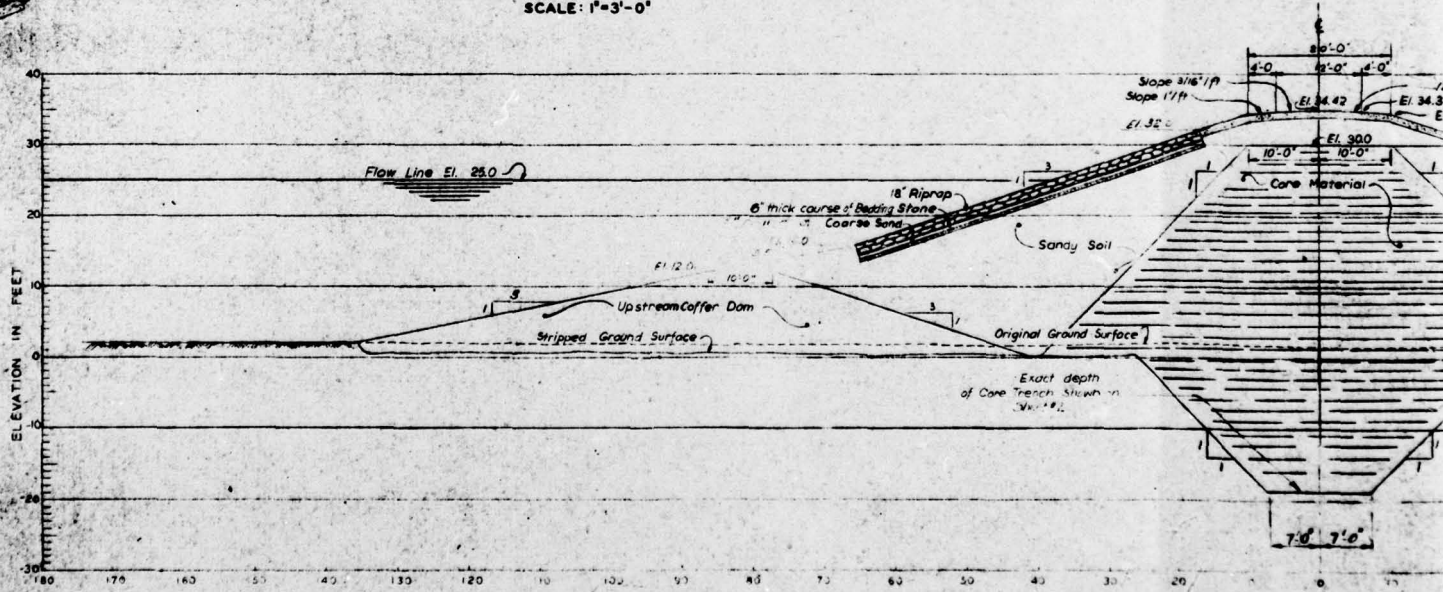


**SECTION 1-1**  
SCALE 1"=10'-0"

NOTE: Details for Typical Road Section adapted from Va. Dept.  
of Highways "Road Designs and Standards."

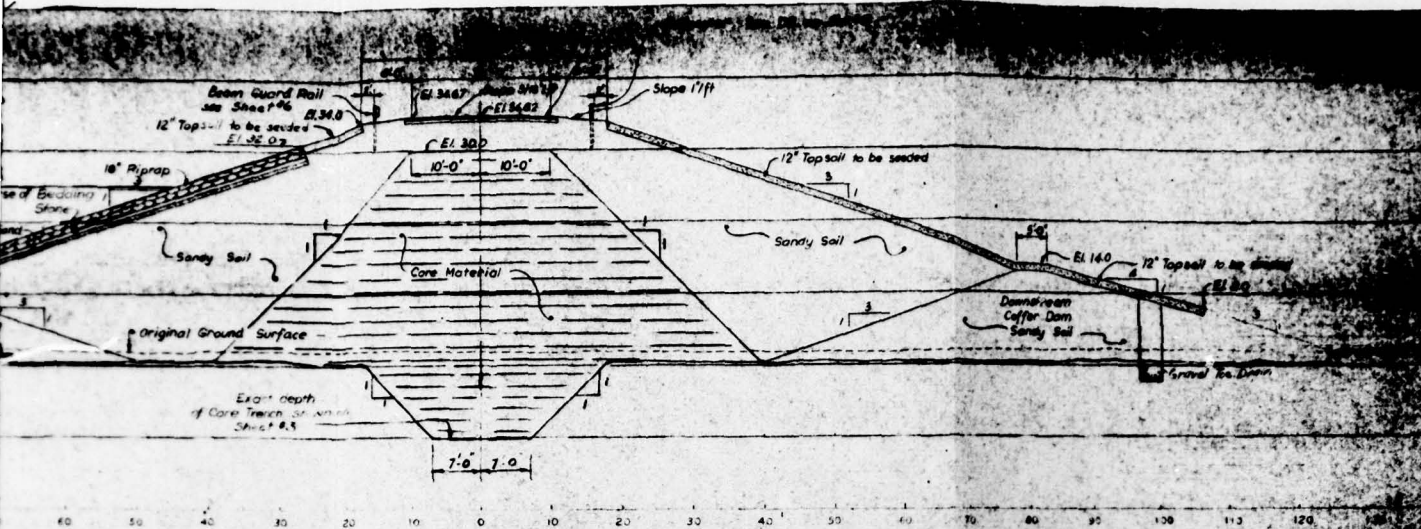


**TYPICAL ROAD SECTION**  
SCALE 1"=3'-0"

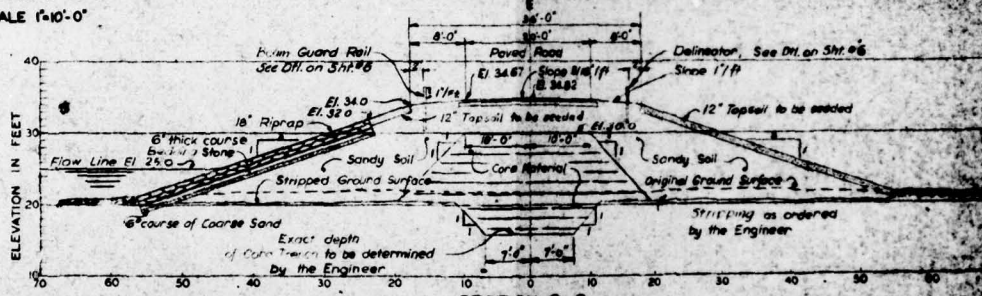
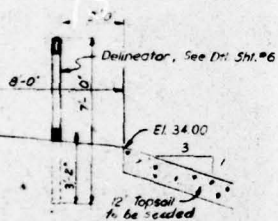


**SECTION 3-3**  
SCALE 1"=10'-0"

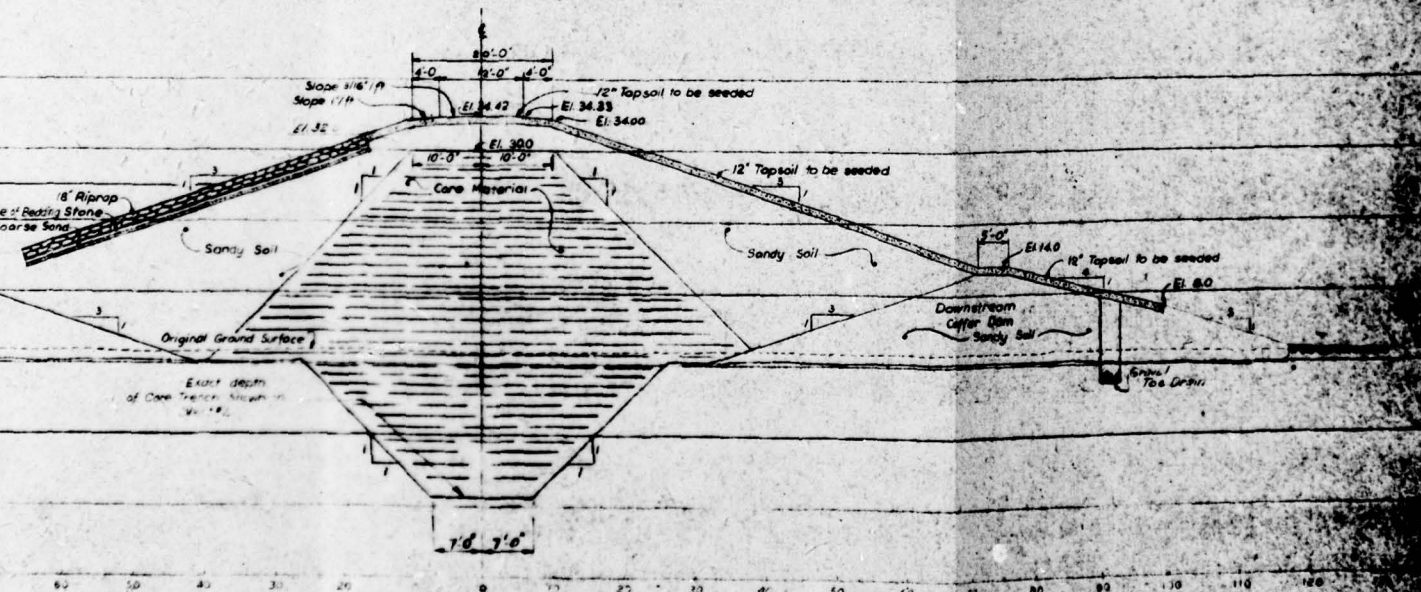




SECTION 1-1  
SCALE 1"=10'-0"



SECTION 2-2  
SCALE 1"=10'-0"



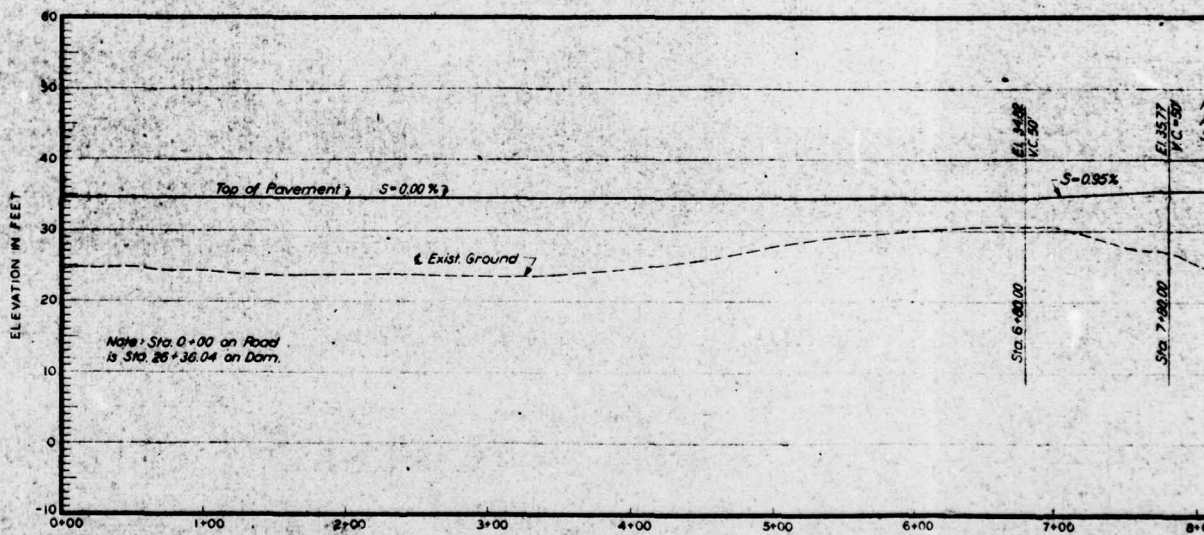
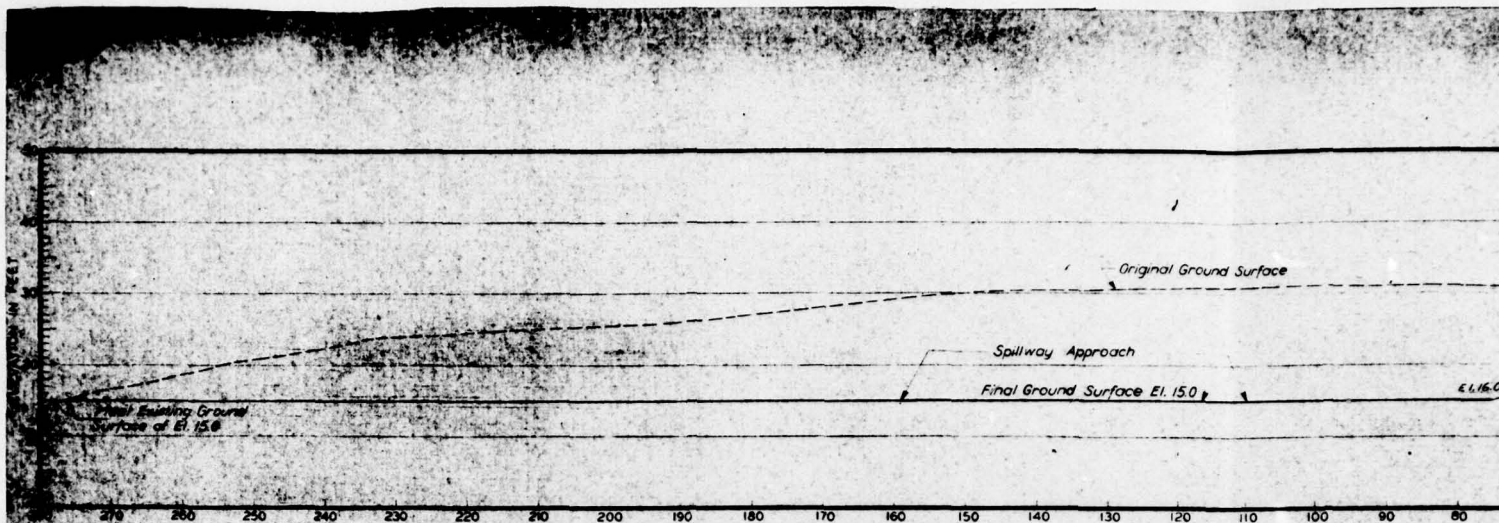
SECTION 3-3  
SCALE 1"=10'-0"

Note: Delineator spacing on straight road 100' on curves 100' intervals.

"AS BUILT"

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DAM SECTION 1-1  
DIAGRAM 1-1

DAM  
SECTIONS AND DETAIL  
SCALE 1"=10'-0"

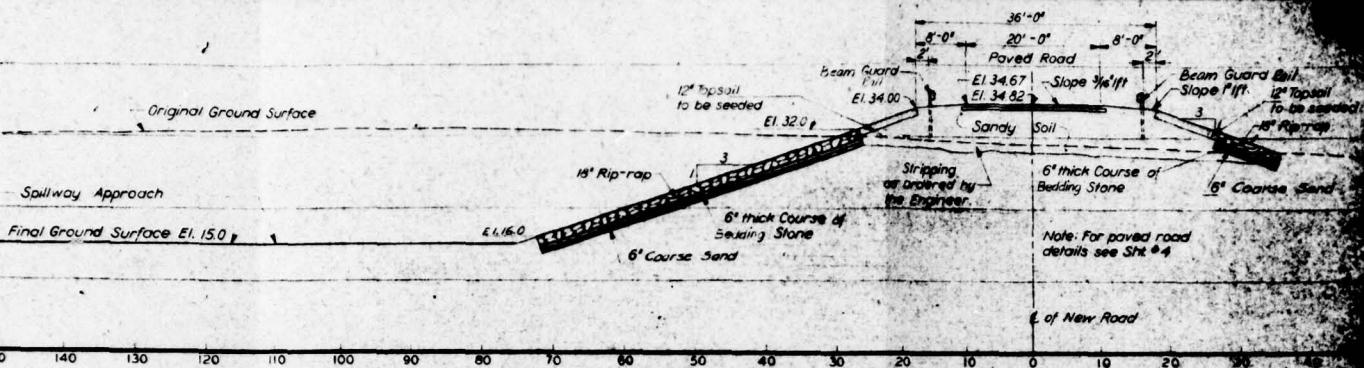


WALSH ENGINEERS  
NEW YORK, N.Y.

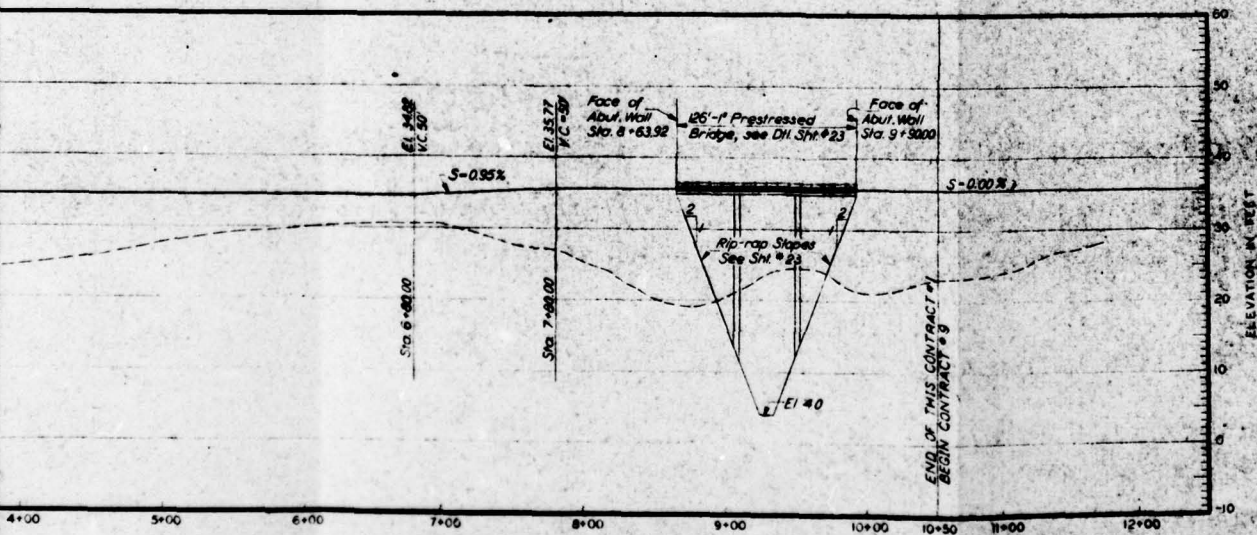
DESIGNED H.D. DRAWN J.B. CHECKED A.P.L.

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
CHASCO WATER PROJECT  
DIAGRAM NO.





SECTION 4-4  
SCALE: 1" = 10'-0"



ROAD PROFILE  
SCALES: HORIZ. 1" = 50', VERT. 1" = 10'-0"

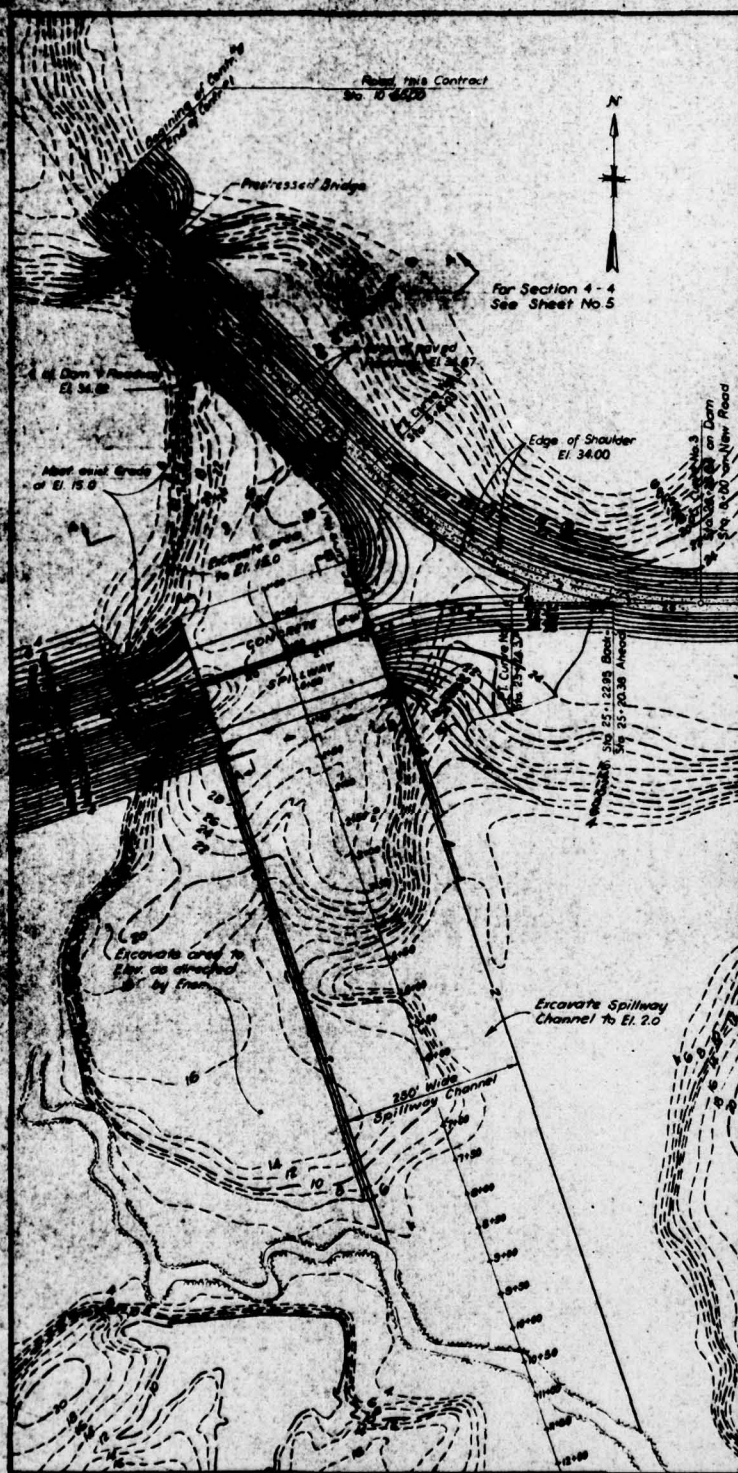
'AS BUILT'

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DIAPHRAGM WATER PROJECT  
DIAPHRAGM DAM

DAM  
SECTION & ROAD PROFILE

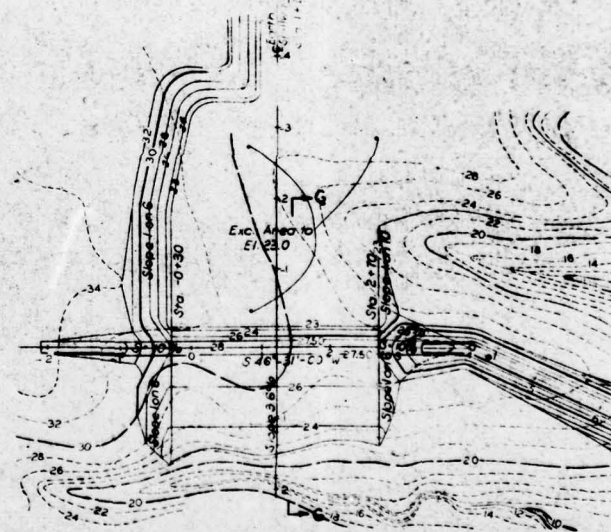
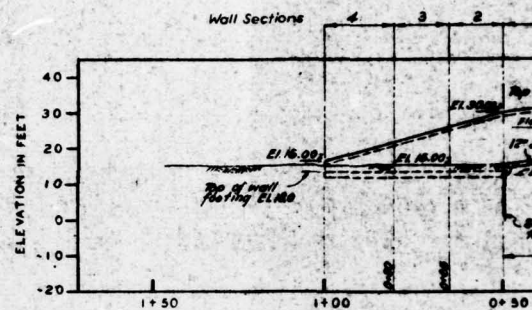
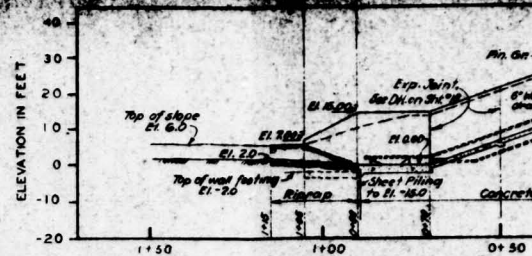
CONTRACT #9





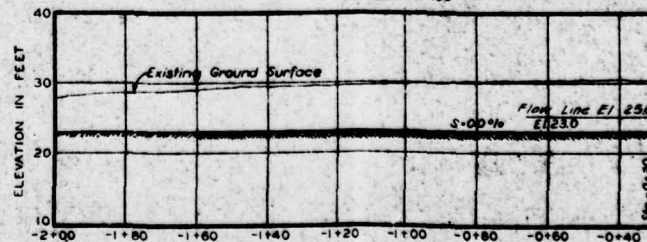
PLAN OF MAIN SPILLWAY

SCALE: 1"=100'

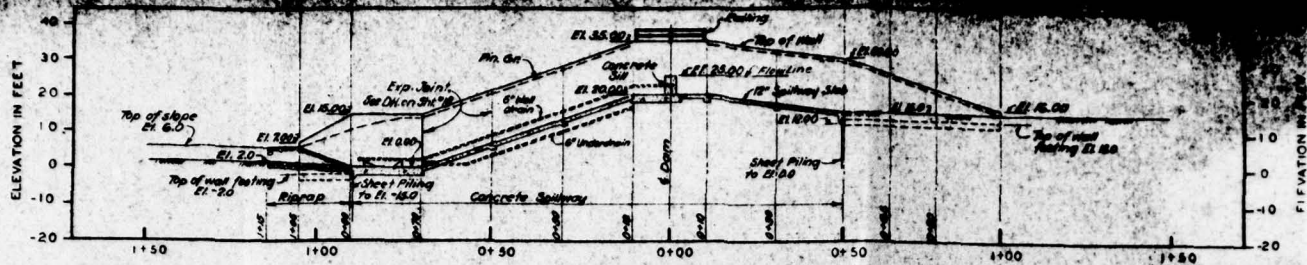


PLAN OF EMERGENCY SPILLWAY

SCALE: 1"=100'

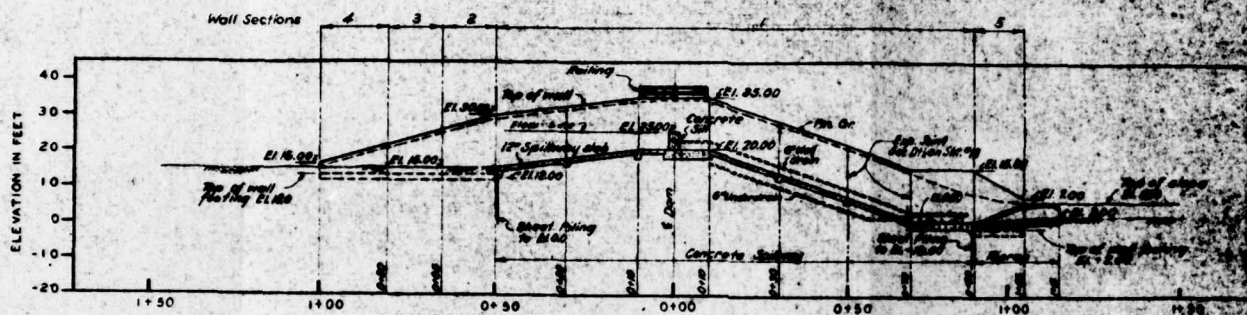


CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DRAINAGE WATER PROJECT



SECTION A-A

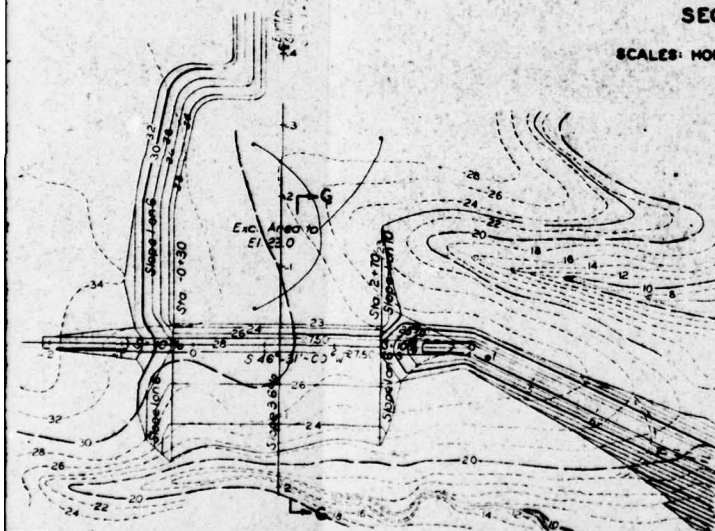
SCALE: HORIZ. 1"=20', VERT. 1"=20'



SECTION B-B

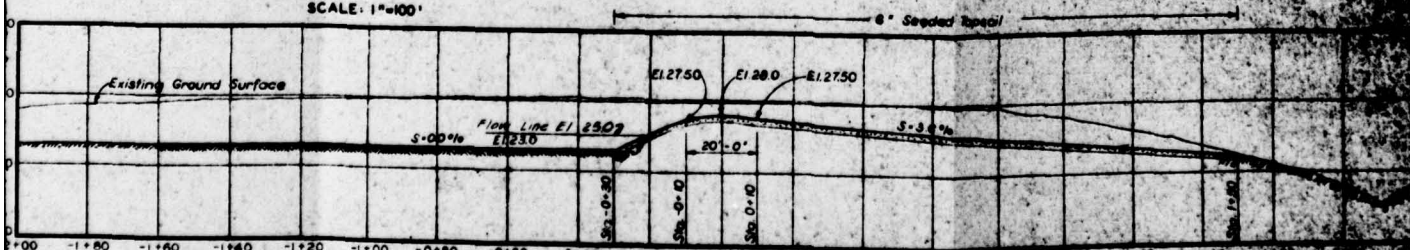
SCALE: HORIZ. 1"=20', VERT. 1"=20'

NOTE: For Details of Wall Sections  
1 Through 5 see S-15  
•• Location of Bearings



PLAN OF EMERGENCY SPILLWAY

SCALE: 1"=100'



SECTION G-G

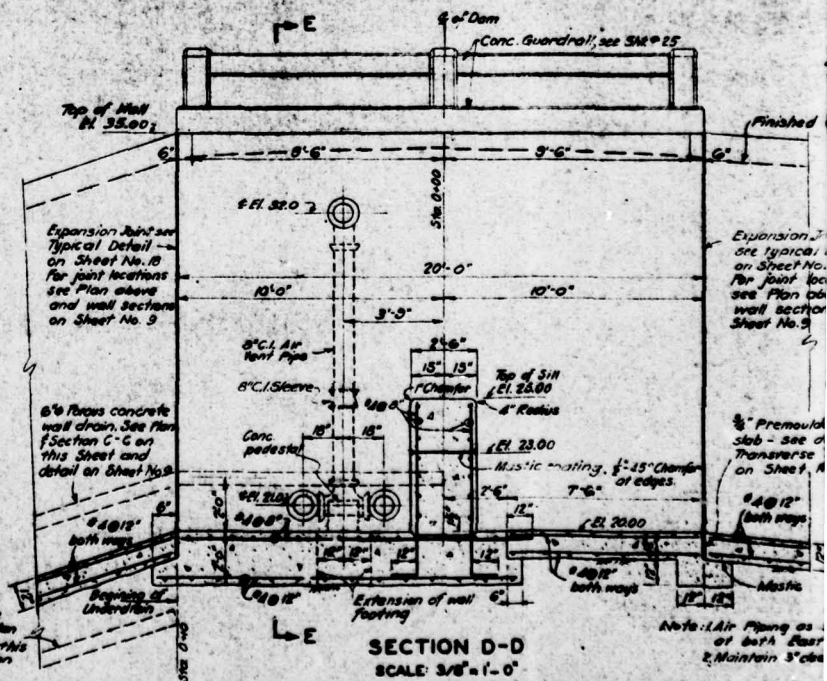
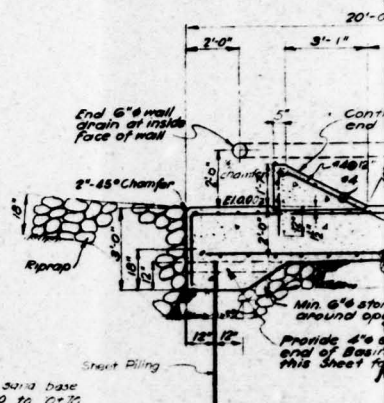
SCALE: HORIZ. 1"=20', VERT. 1"=10'

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DRAINAGE WATER PROJECT

DAM - SPILLWAYS  
PLANS AND SECTIONS

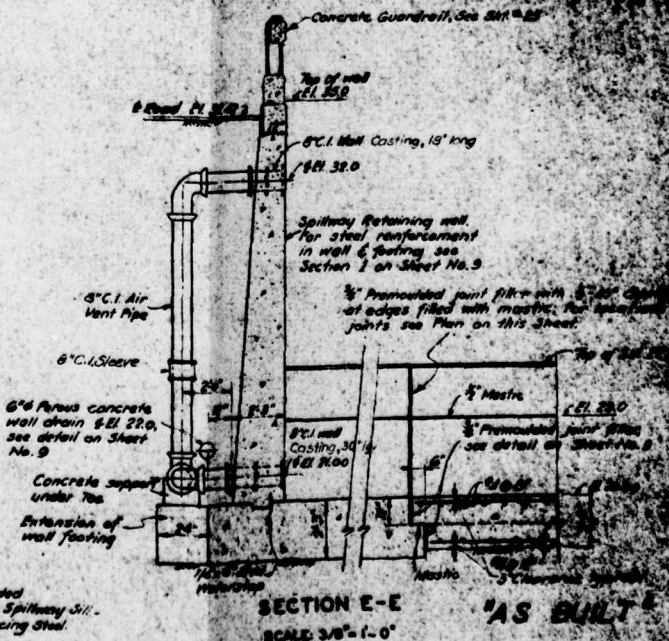
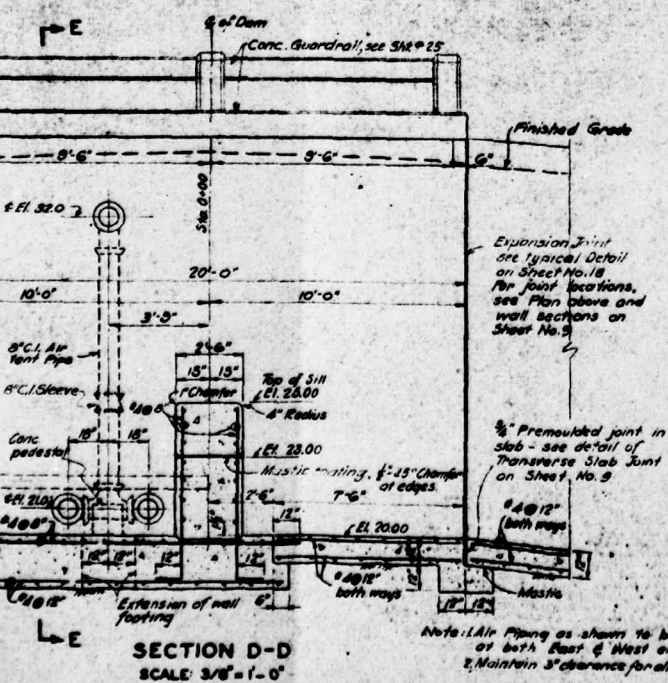
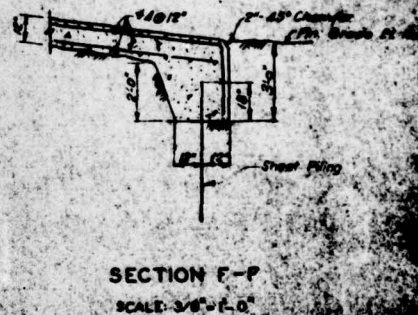
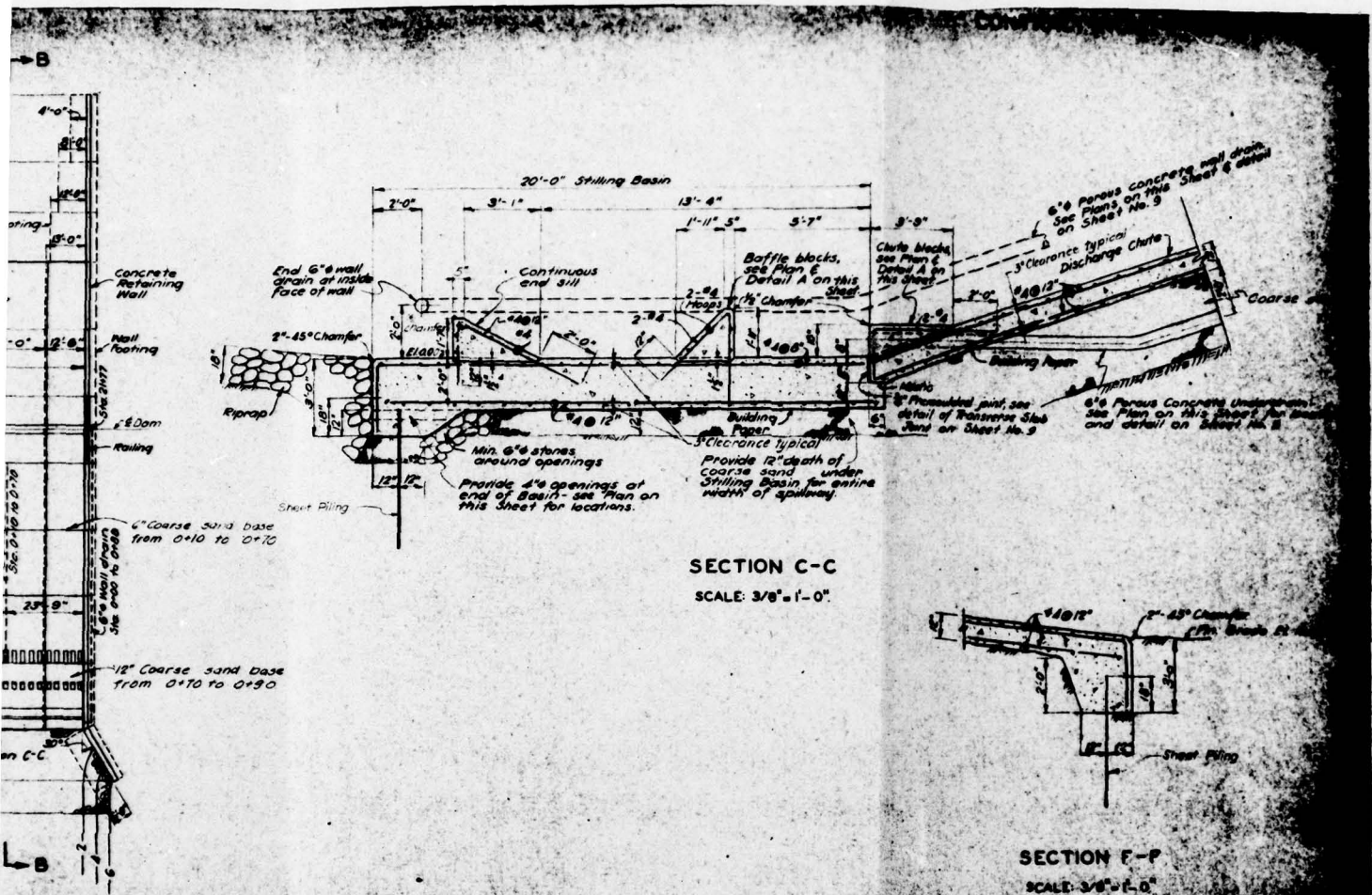
CONTRACT NO.  
DATE





**CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DISCUND WATER PROJECT**

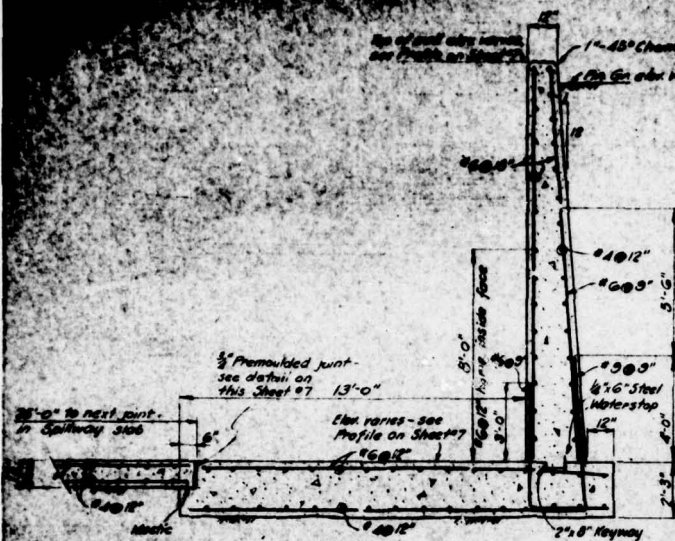




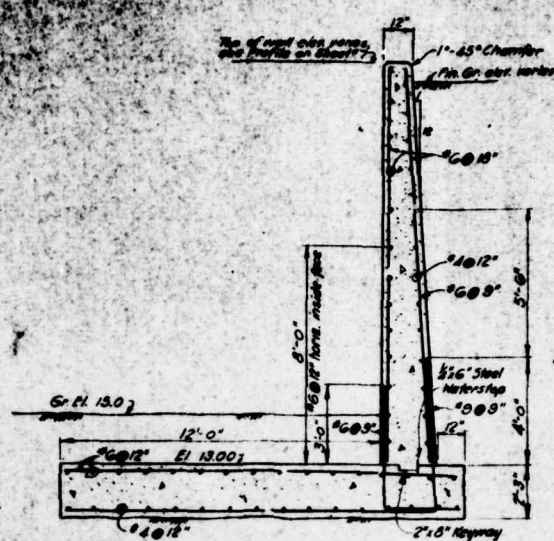
CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
DAM AND WATER PROJECT  
DAM AND WATER PROJECT

DAM - MAIN SPILLWAY  
PLANS, SECTIONS AND DETAILS

CONTRACT NO. 1



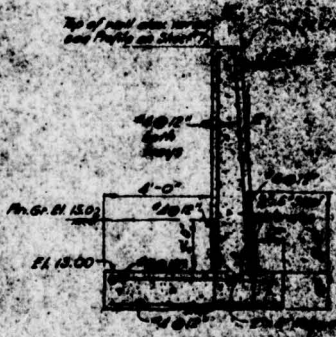
SECTION 1



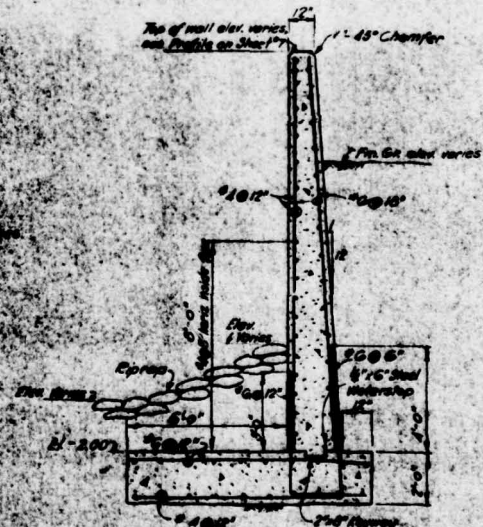
SECTION 2



SECTION 3



SECTION 4

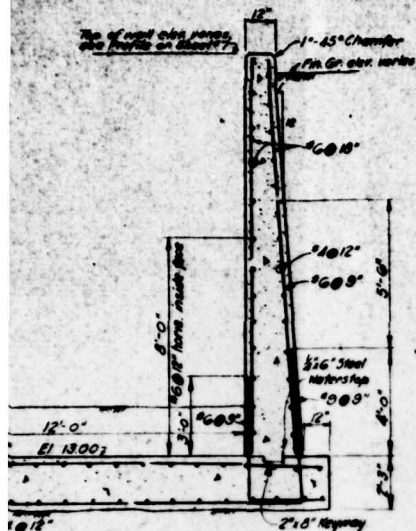


SECTION 5

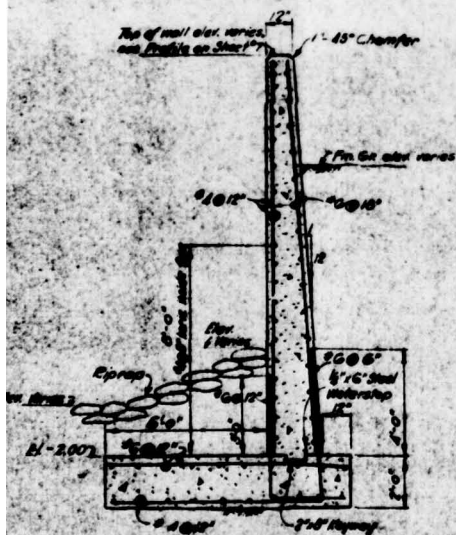
1- Provide 5' clearance for all retaining wall.  
 2- Provide 5' per foot clear of wall for all walls.  
 3- See Plan & Profiles on Sheet 7 for elevations, locations and other information.  
 4- See Sheet 10 for vertical joints in wall for joint locations see Section A-A & B-B on Sheet 7. Continue every other horizontal reinforcing bars through vertical joints.

**SPILLWAY RETAINING WALL SECTIONS**



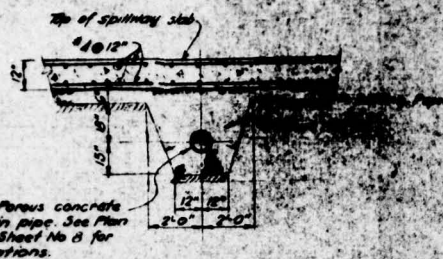


SECTION 2

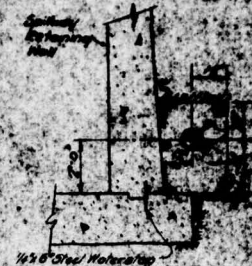


SECTION 5

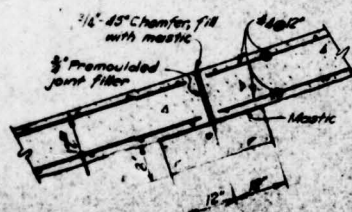
at all walls, locations, and openings, and other details.



DETAIL OF UNDERDRAIN



DETAIL OF WALL DRAIN

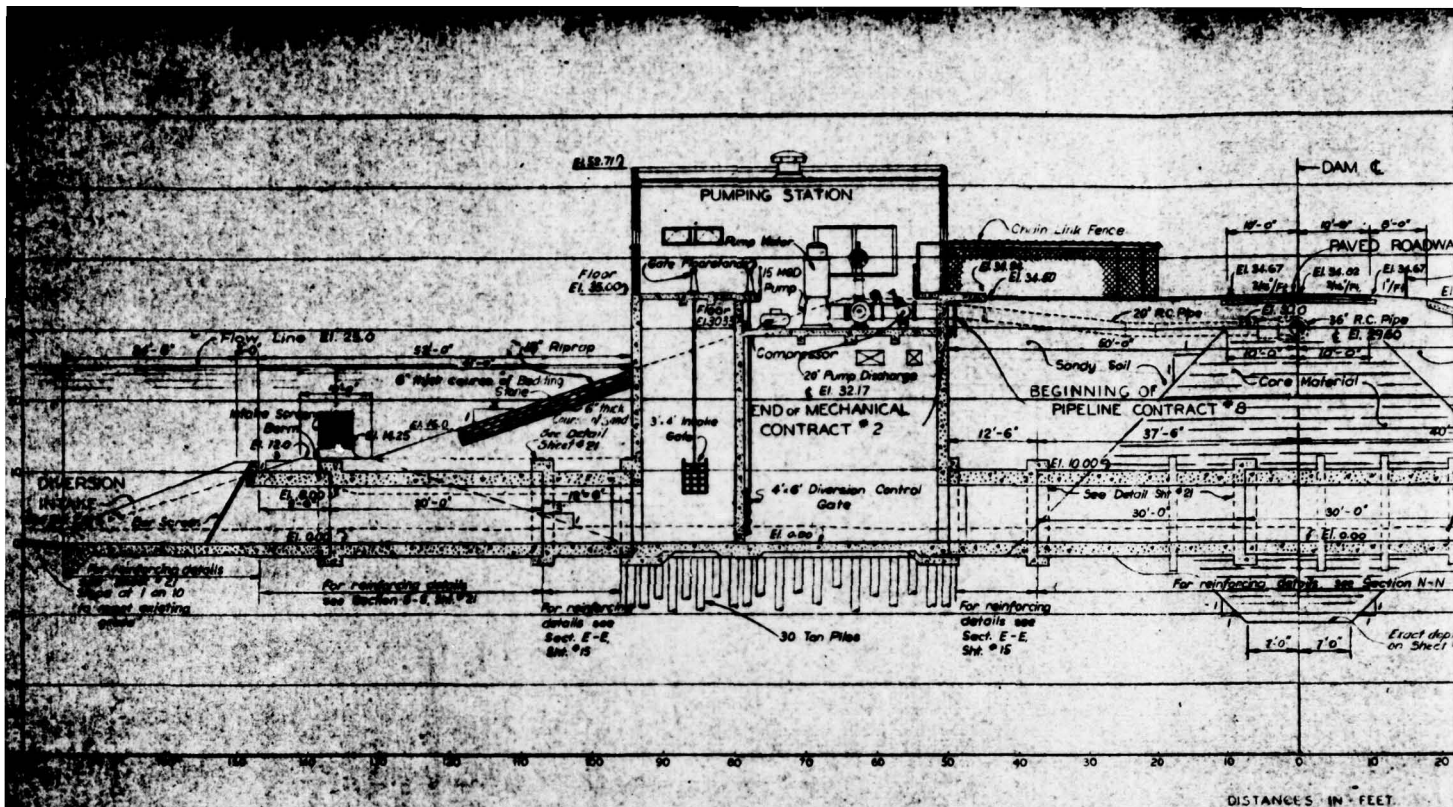


TRANSVERSE SLAB JOINT  
SCALE: 3/4"=1'-0"

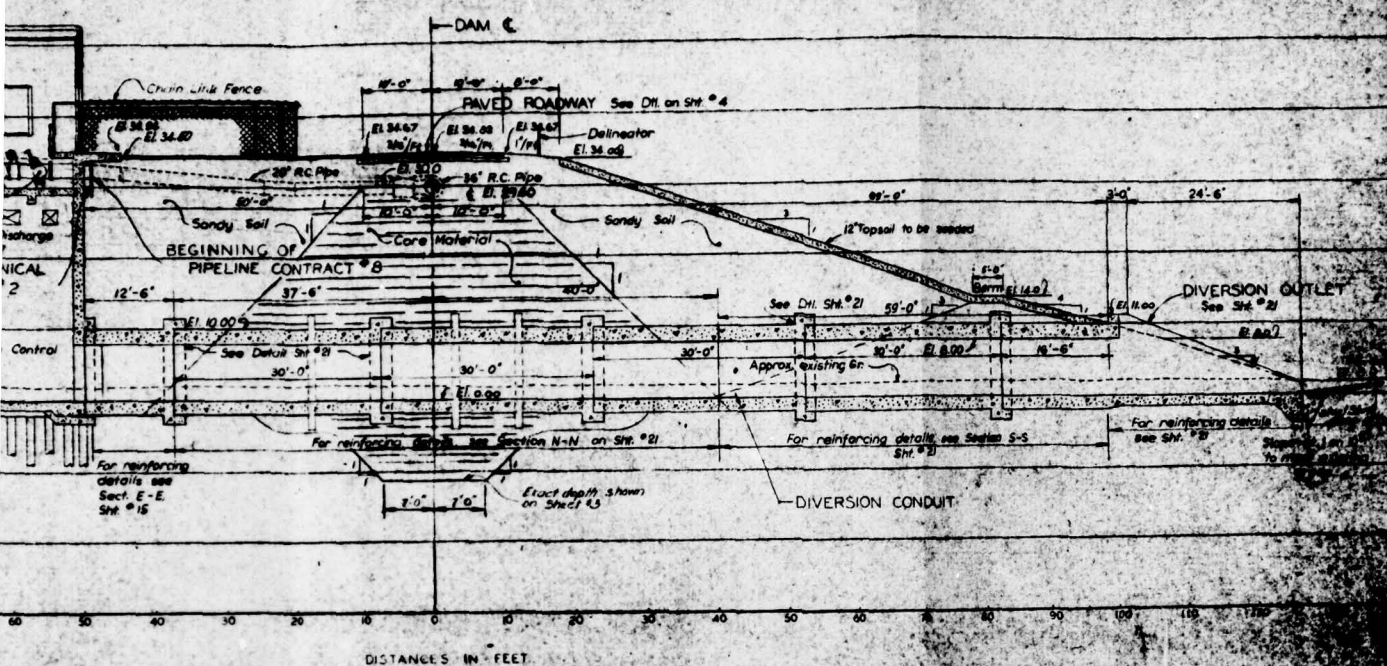


LONGITUDINAL SLAB JOINT  
SCALE: 3/4"=1'-0"





GENERAL SECTION THROUGH PUMPING  
STA. 44+60  
SCALE: 1/4" = 1'-0"



GENERAL SECTION THROUGH PUMPING STATION  
STA. 44+60  
SCALE 1"=10'-0"

CITY OF NEWPORT NEWS, VA.  
DEPARTMENT OF PUBLIC UTILITIES  
CHASLUM WATER PROJECT

PUMPING STATION  
TYPICAL SECTION

CONTRACT NO. 10-1-1  
SHEET 10-1-1



**APPENDIX II**  
**PHOTOGRAPHS**



UNGATED SPILLWAY AND STILLING BASIN



EMERGENCY SPILLWAY





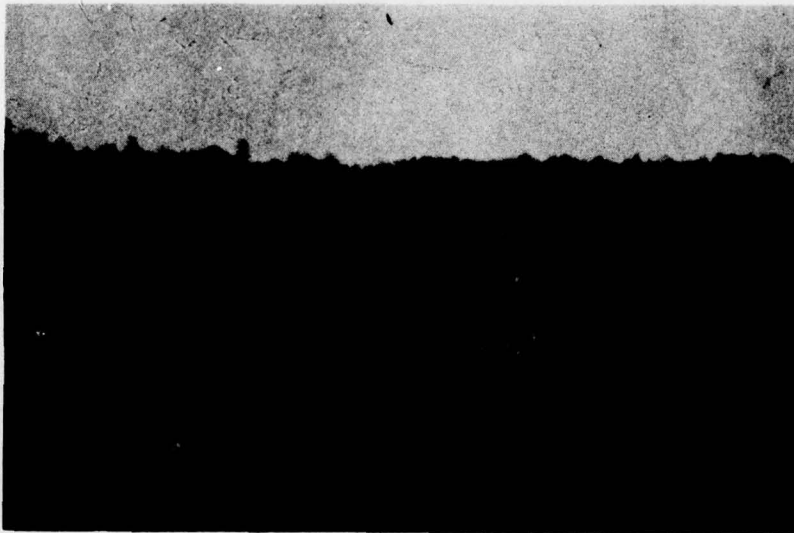
UPSTREAM SLOPE OF EMBANKMENT WITH RIPRAP



DOWNSTREAM SLOPE OF LEFT EMBANKMENT

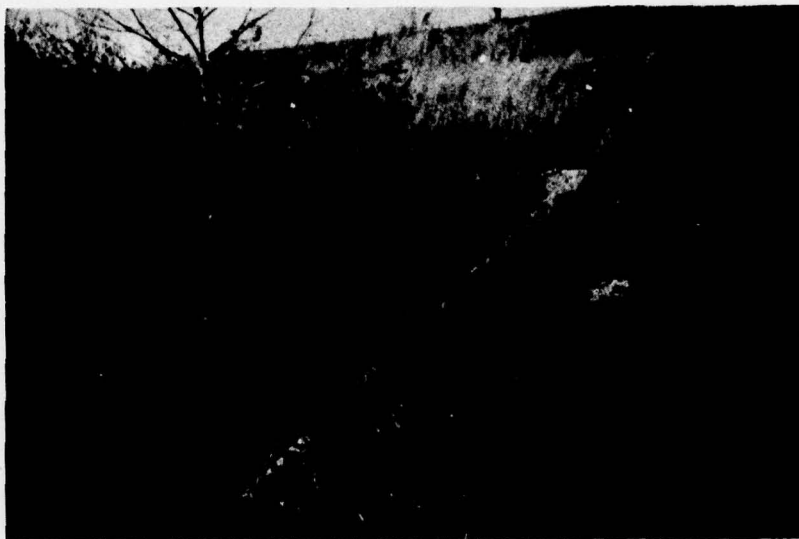


ROAD AND PUMP STATION ON LEFT EMBANKMENT



DOWNSTREAM CHANNEL AND FLOOD PLAIN OF UNGATED SPILLWAY





OUTLET CHANNEL BELOW PUMP STATION



EROSION OF DOWNSTREAM RIGHT EMBANKMENT LEFT OF EMERGENCY SPILLWAY

**APPENDIX III**  
**FIELD OBSERVATIONS**



### APPENDIX III

#### PHASE I - FIELD OBSERVATIONS

Name of Dam: Diascund Reservoir Dam (VA 12703)  
County: New Kent State: Virginia  
Coordinates: Lat. 3725.8 Long. 7654.0  
Date of Inspection: 14 December 1978  
Weather: Fair  
Temperature: 45° F  
Pool Elevation at Time of Inspection: 26.0<sup>+</sup> m.s.l.  
Tailwater at Time of Inspection: 3.0<sub>+</sub> m.s.l.

#### Norfolk District Inspection Personnel:

Jim Robinson, Hydrology  
Jeff Irving, Coordinator  
Dave Pezza, Soils

#### Other attendees:

Charlie Crowder, Utility Engineer  
Ed Lett, Reservoir and Watershed Supervisor  
Danny Pitts, Pump Station Operator

1. GENERAL: At the time of the inspection, the level of the water in the reservoir was 26.0<sub>+</sub>.

2. EMBANKMENT: Vehicle access to the right embankment was non-existent due to wet conditions. Only one person was able to walk 1/2 mile through mud and water to inspect the embankment. The face of this portion of the embankment and emergency spillway were covered with tall grass and coniferous trees up to 12-inches in diameter. The area immediately downstream of the emergency spillway was heavily vegetated with the same type of trees.

The left embankment is landscaped and has several trees along the road that transverses the crest of the dam. The trees were planted by the city.

2.1 Surface Cracks: The slopes, crest, and abutment contacts were inspected and no cracks were found. However, the face of the right embankment was covered with thick vegetation inhibiting a thorough investigation.

2.2 Unusual Movement: No unusual movement of the dam was noted. The vegetation inhibited observations.

2.3 Sloughing or Erosion: No sloughing was noted. A portion of the downstream right embankment abutting the left of the emergency spillway has eroded (see photos) and should be repaired.

2.4 Alignment: The vertical and horizontal alignment of the dam did not deviate from the as-built drawings.

2.5 Riprap: No riprap failures were found on the upstream face of the dam. Small trees less than 2-inches in diameter were growing in the upstream slope protection on the right embankment and should be removed.

2.6 Junctions: No problems were observed at the junctions of the embankment and abutments, and spillway and dam.

2.7 Seepage: No seepage was observed.

2.8 Foundation Drains: Drains were not observable, but the downstream area was unusually wet. According to Danny Pitts, Pump Station Operator, the wetness is due to discharge from toe drains.

### 3. Water Works:

3.1 Intake Structure: The intake structure at the pump station is submerged below the normal pool elevation.

3.2 Outlet Works: Two 20-inch reinforced concrete pipes at elevation 31.0 furnish raw water through the dam to a 42-inch raw water pipe that supplements Lee Hall Reservoir and Harwood's Mill Reservoir when needed. The pipes are buried underground and could not be observed.

### 4. Spillways:

4.1 Principal: A stilling basin extends from the toe of the dam to approximately 20 feet downstream. The discharge channel is in good condition except for some damage to two concrete panels on the right portion of the channel due to settlement. Baffle blocks and chute blocks are placed across the basin to dissipate energy and protect the immediate downstream area. The channel is about 5 feet deep and 50 feet wide with immediate flood plain flat and wide. The tailwater was approximately 3.0 feet m.s.l.

4.2 Emergency: An earthfill side channel located on the extreme right portion of the embankment has never been used. Trees have grown on the crest and in the downstream area of the discharge channel.

5. Reservoir: The area surrounding the upstream reservoir consists of mild slopes with some wooded terrain and some open fields. No observations of sediment could be made. The water was clear with little debris. Recently cut trees from upstream face of dam are floating in reservoir but pose no problems because of their small size.



6. Downstream Channel: Two channels, one below the principal spillway and one below the drawdown outlet were observed. The channel below the principal spillway was flowing and the surrounding terrain was flat. The channel below the drawdown outlet was ponded with little or no apparent seepage discharge from two 4-foot by 6-foot sluice gates below the pump station. The reason for the pond or the amount of flow could not be determined because of swamp conditions downstream.

7. Instrumentation: A gage in the pump station provides the reservoir elevation.


**APPENDIX IV**

**TEST BORINGS**



**FROEHLING & ROBERTSON, INC.**  
INSPECTION ENGINEERS • CHEMISTS • BACTERIOLOGISTS

BRANCH LABORATORIES  
ROSFORD, CHARLOTTE, RALEIGH  
WASHINGTON, BALTIMORE

SINCE  1961  
Richmond, Virginia  
April 5, 1962

MAIN OFFICE & LABORATORIES  
814 WEST GARY STREET  
RICHMOND, VIRGINIA

No. F-1437-3

Report of: Soil Borings

Made for: Malcolm Pirnie Engineers  
25 West 43rd. St.  
New York 36, N.Y.

Project: Proposed Dissound Creek Dam

Location: 1 Mile North of Route 67 at Dissound Creek

Date Made: March 1960

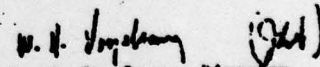
Upon authorization from Malcolm Pirnie Engineers, test borings were made at site of Proposed Dissound Creek Dam.

The test borings were made by means of wash and auger boring and the penetration resistance of the soil was determined by means of the Standard Penetration test at each change in strata or at five foot intervals, whichever occurs first. In the Standard Penetration test a 140 lb. hammer dropping 30" is used to drive a 2 1/2" D. 1.375" I.D. Split Spoon Sampler 1 foot into the soil. The results of the tests are shown in the following boring logs.

Where double numbers are used in reporting the auger probes, two borings were made to obtain sufficient samples for laboratory testing.

Respectfully,

FROEHLING & ROBERTSON, INC.

  
W. H. Vogelzang, Director  
Foundation Investigation

LEV/cv

MEMBERS: American Society for Testing Materials • American Concrete Institute • American Council of Commercial Laboratories • Virginia Academy of Science  
American Road Builders Association • Southern Association of Science & Industry • Society for Nondestructive Testing  
REPRESENTED BY: American Wood Preservers Association • Association of Asphalt Paving Technologists • American Water Works Association • American Chemical Society • American Public Health Association • Technical Association Pulp & Paper Industry

# FROEHLING & ROBERTSON, INC.

## INSPECTION ENGINEERS • CHEMISTS • BACTERIOLOGISTS

SINCE  1961

BRANCH LABORATORIES  
NORFOLK, CHARLOTTE, BALTIMORE  
WASHINGTON, BALTIMORE

MAIN OFFICE & LABORATORIES  
814 WEST CARY STREET  
RICHMOND, VIRGINIA

Report No. 4-1430-3**TEST BORING LOG**Made for: Valencia Lirio EngineersProject: Proposed Discharge Creek DamLocation: 1 Mile North of Route 60 at Discharge CreekAll borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datumNo. 1Elevation 27.4Sta. 19.470

Depth	Soil Status	Blows
0.0	Topsoil	
0.5	Brown clay	0
9.0	Brown & Gray clay fairly plastic	
11.5	Brown fine sand wet	5
13.5	Brown & Gray clay. Medium plastic. Moist	
17.5	Very fine brown sand. very wet	3
20.0	Consolidated sand. fine clay medium. wet	14
25.0	Boring Terminated Water Table = 7.0	

No. 2Elevation 27.3Sta. 19.470

Depth	Soil Status	Blows
0.0	Topsoil	
1.0	Brown fine grain clayey sand. Moist	12
7.0	Multicolored fine sand with very little clay. getting a little wet at 11.0'	12
16.5	Gray silty clay. Moist	10
25.0	Boring Terminated Water Table = 13.7	11

No. 2-1Elevation 28.9Sta. 19.470

Depth	Soil Status	Blows
0.0	Topsoil	
0.5	Brown clay	
3.0	Medium compact	19
	Fine brown sand trace of clay. Moist	
12.5	Fine grain multicolored clayey sand. wet	7
16.5	Fine grain gray silty sand. Moist	11
23.5	Fine grain brown silty sand. wet	7
25.0	Boring Terminated Water Table = 14.0	

\*No. of blows, 140 lb. hammer, 30 in. Fall, required to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.



# FROEHLING & ROBERTSON, INC.

## INSPECTION ENGINEERS • CHEMISTS • BACTERIOLOGISTS

SINCE  1881

BRANCH LABORATORIES  
NORFOLK, CHARLOTTE, RALEIGH  
WASHINGTON, BALTIMORE

MAIN OFFICE & LABORATORIES  
814 WEST GARY STREET  
RICHMOND, VIRGINIA

Report No. R-147C-3**TEST BORING LOG**Made for: Melvin Linn EngineersProject: Improve Oldsoud Creek DamLocation: 1 mile North of Route 10 at Oldsoud CreekAll borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datumNo. 2Elevation 27.5Sta. 2045

Depth	Soil Status	Blows
0.0		
1.0	Topsoil	
	Brown Sand with Very little Clay	8
4.0		12
	Brown Very Fine Silty Sand. Moist	8
19.0		7
	Grey Very Fine Silty Sand. Moist	
24.0		10
	Boring Terminated Water Table - 9.5	

No. 4Elevation 27.0Sta. 2047

Depth	Soil Status	Blows
0.0		
1.0	Topsoil	
2.5	Brown Silty Clay	16
	Brown & Gray Clayey Sand	1
17.0		6
	Grey Clayey Silty Sand	1
24.0		13
	Boring Terminated Water Table - 11.0	

No. 5Elevation 26.8Sta. 2140

Depth	Soil Status	Blows
0.0		
1.5	Topsoil	
	Fine Brown Sand with little Clay getting wet at 3.0'	17
10.0		10
	Brown Clayey Sand. Wet	13
18.5		10
	Grey Silty Sand. Moist	
24.0		10
	Boring Terminated Water Table - 11.0	

Note: All blow counts are based on 14 lb. Fall, corrected to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.

# FROEHLING & ROBERTSON, INC.

## INSPECTION ENGINEERS • CHEMISTS • BACTERIOLOGISTS

SINCE  1881

BRANCH LABORATORIES  
NORFOLK, CHARLOTTE, RALEIGH  
WASHINGTON, BALTIMORE

MAIN OFFICE & LABORATORIES  
814 WEST CARY STREET  
RICHMOND, VIRGINIA

Report No. 147-3

### TEST BORING LOG

Made for: Helmsville Circle EngineersProject: Imperial Gasland Trunk LineLocation: 2 1/2 mile north of mile 60 at Mound CreekAll borings are plotted to scale of 1 in. = 5 ft. using \_\_\_\_\_ as a fixed datum

No. <u>6</u>		
Elevation <u>5.5</u>		
Sta. <u>1475.0</u>		
Depth	Soil Status	Blows
0.0		
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		
4.5		
5.0		
5.5		
6.0		
6.5		
7.0		
7.5		
8.0		
8.5		
9.0		
9.5		
10.0		
10.5		
11.0		
11.5		
12.0		
12.5		
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RICHMOND, VIRGINIA

Report No. W-147C-3**TEST BORING LOG**Made for: Malcolm Pirnie EngineersProject: Proposed Discharge Creek DamLocation: 1 1/2 Miles North of Route 60 at Discharge Creek

All borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datum

No. 8Elevation 22.2  
Sta. 1+400.0

Depth	Soil Status	Blows
0.0		
1.0	Topsoil	
	Light Blue Silty Sandy Clay Medium Plastic	
8.0		
	Blue Silty Clayey Sand, Sand Fine Grains, Little Plastic	12
16.0		14
	Blue Green Clayey Sand	
		20
26.0		1*
	Boring Terminated Water Table 0.9	

No. 9Elevation 22.8  
Sta. 2+345.0

Depth	Soil Status	Blows
0.0		
0.5	Topsoil	
2.5	Brown Sandy Clay	
	Brown Fine Grains Sand, getting wet at 4.0'	19
4.5		
7.5	Note (1) Multicolored Clay	5
12.0		
	Dark Brown Silty Clay, Some Fine Sand, Some Wood	?
17.5		
	Gray Medium Sand with trace Small Gravel & trace of wood Set.	19
24.0		20
	Boring Terminated Water Table 9.2	
	Note (1) Brown Fine Grains Clayey Sand, Set	

No. 10Elevation 23.5  
Sta. 2+400.0

Depth	Soil Status	Blows
0.0		
1.0	Topsoil	
2.0	Brown Sandy Clay	
	Grayish Brown Clayey Sand, Very Fine Grains	13
		6
12.0		
	Gray Clayey Sand, Fine Grains	3
		19
22.0		
	Blue Gray Clayey Sand, Fine Grains	
24.0		20
	Boring Terminated Water Table Boring Caved in 14.0'	

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RICHMOND, VIRGINIA

Report No. F-147-3**TEST BORING LOG**Made for: Valencia Tinnie EngineersProject: Proposed Chesand Creek DamLocation: 1 mile North of Route 60 at Chesand CreekAll borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datum

No. <u>11</u>	Elevation <u>10.1</u>	Soil Status	Blows
0.0	10.1	Forest	
0.5	10.1	Well-sorted Silty Sand, Trace of Clay	15
6.0	10.1	Note (1)	
7.5	10.1	Tan Silty Clay	6
12.0	10.1		7
	10.1	Gray Plastic Silty Clay	
15.0	10.1		7
	10.1	Plastic Brown Silty Clay & Sand Fragments (cont)	
25.0	10.1		10
	10.1	Boring terminated Water Table 12.5	
	10.1	Note (1)	
	10.1	Tan Silty Sand, Fine Grained	

No. <u>11-1</u>	Elevation <u>10.1</u>	Soil Status	Blows
0.0	10.1	Forest	
0.5	10.1	Well-sorted Silty Sand, Trace of Clay	
6.0	10.1	Note (1)	
7.5	10.1	Tan Silty Clay	
12.0	10.1		
	10.1	Gray Plastic Silty Clay	
15.0	10.1		
	10.1	Plastic Brown Silty Clay & Sand Fragments (cont)	
27.0	10.1		7
	10.1	Blue Gray Silty Sand, Fine Grained	
	10.1	Boring terminated Water Table 12.5	
	10.1	Note (1)	
	10.1	Tan Silty Sand, Fine Grained	
	10.1	Note	
	10.1	Super notes to 25.0'	

No. <u>12</u>	Elevation <u>7.5</u>	Soil Status	Blows
0.0	7.5	Forest	
0.5	7.5	Tan Silty Sand, Sand fine Grain, Poorly Graded, Poorly Interbedded, Trace of gravel latter	5
	7.5		12
13.0	7.5		17
	7.5	Gray Sandy Clay, Clay medium to coarse, clay layer with North until strata becomes a clayey sand.	
25.0	7.5		0
	7.5	Boring terminated Water Table 2.5	

Notes at bottom left in brackets on all soil samples to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.



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Report No. 9-143-3**TEST BORING LOG**Made for: Walcott Pirnie EngineersProject: Proposed Linwood Creek DamLocation: 2 Miles North of Route 60 at Linwood CreekAll borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datumNo. 13Elevation 7.2  
Sta. 35450.8

Depth	Soil Status	Blows
0.0		
0.5	Topsoil	
1.0	Brown Sand. Moist	
4.0		
	Brown Clayey Sand turning Gray at 8.0'	
12.0	Note (1)	22
15.0	Gray Sand with some silt, Fine Grain	19
22.0	Gray Sandy Silt with some clay	20
25.0	Boring terminated at Water Table 4.0	
	Note (1) Dark Brown Sandy Clay	

No. 14Elevation 11.9  
Sta. 35450.8

Depth	Soil Status	Blows
0.0		
0.5	Fine Grain Brown Sand. Moist	6
8.0	Medium Coarse Brown Sand. Wet	3
12.0		17
	fine Silty Sand. Moist	12
25.0	Boring terminated at Water Table 4.0	14
	Note (1) Dark Brown Sandy Clay	

No. 15Elevation 2.5  
Sta. 35450.8

Depth	Soil Status	Blows
0.0		
0.5	Fine Grain Multicolored Sand	15
7.0	Gray Sandy Silt. Wet	2
13.0	Gray Silty Sand. Fine Grain	9
26.0	Boring terminated at Water Table 4.0	12
	Note (1) Dark Brown Sandy Clay	

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**MAIN OFFICE & LABORATORIES  
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RICHMOND, VIRGINIA**

Report No. M-2632-3

## TEST BORING LOG

Made for: Matco's Fire Engine

Project: Fremont Disposal Creek Dam

**Location:** 1 Mile North of Route 60 at Elisevud Creek

All borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datum

Depth	Soil Status	Stones
0.0	<p>Fine Grain Gray Sand. Wet</p>	10
10.0	<p>Medium Coarse Sand &amp; Unod.</p>	2
13.0	<p>Wet</p>	
	<p>Gray Sandy Silt. Medium Compact. Moist.</p>	6
		15
26.0		12
	<p>Boring terminated Water Table 6.0</p>	

Depth	Soil Status	Blow
0.0	Gr. sly. clay	
3.5	fine grain Gray Sand with wood	4
15.0	Also Silty Sand. Moist	12
20.0	Testing Terminated Water Table 2.1	13

Depth	Soil Status	Moisture
0.0	Very Silty Clayey Sand.	
9.5	Very Silty sand. Moist	
25.0	Gravelly sandstone Water Table 3.4	

\*No. of blows, 140 lb. hammer, 30 in. fall, required to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.



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Report No. A-1630-3

## TEST BORING LOG

Made for Calvin Harris Engineers

Project: Proposed "Island" Creek Dam

Location: 1 1/2 miles North of Route 60 at Pleasant Creek

All borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datum

19

No. 33

30 Jan '8

Elevation 29.5  
Sta. 4440

Elevation: 2.9  
2.9. 4.0. 5.0. 6.0

**Elevation**

Depth	Soil Status	Blows
0.0	Surface	
0.5		
	Fine Brown Sand. Dry	22
7.9		
	Multicolored Sand, Trace of Silt. Dry	33
		20
17.0		
	Multicolored Very Fine Silty Sand with Very Little Clay.	18
22.0	Water	
		16
	Green Very Fine Sand with Very Little Clay	
29.0		
	Boring Terminated Water Table 22.5	

Depth	Soil Status	Moist
5.0		
3.0	Gravel Rock	
	Gray Sandy Silt. Wet	2
0.5		
	Gray Fine Grain Sand. Wet	4
19.5		
		6
	Gray Sandy Silt. Moist	11
		12
		13
		14
		15
		16

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\*Wt. of blow, 140 lb. hammer, 30 in. Fall, required to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.

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 MAIN OFFICE & LABORATORIES  
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 RICHMOND, VIRGINIA
Report No. R-1440-3**TEST BORING LOG**Made for: Malcolm Pirnie EngineersProject: Proposed Diamond Creek DamLocation: 1 Mile North of Route 30 at Diamond Creek

All borings are plotted to scale of 1 in. = 5 ft. using \_\_\_\_\_ as a fixed datum

No. 21Elevation 3.2  
Sta. 1+21.5 at 5'

Depth	Soil Status	Blows
0.0		
1.0	Stumpy Muck	
2.0		8
3.0	Gray Fine Grain Sand & Mud	7
4.0		7
5.0		24
6.0		31
7.0	Light Silty Sand, medium Grains	33
8.0	Spring Termination Water Table 0.5	34

No. 22Elevation 2.1  
Sta. 1+21.5 at 5'

Depth	Soil Status	Blows
0.0		
1.0	Stumpy Clay	
2.0		12
3.0	Light Fine Grain Sand with Mud	11
4.0		9
5.0		15
6.0	Light Silty Sand, medium Grains	15
7.0		14
8.0	Spring Termination Water Table 0.0	

No. 23Elevation 12.6  
Sta. 1+21.5 at 5'

Depth	Soil Status	Blows
0.0		
1.0	Termination	
2.0	Soft White Sand, spots of Clay	9
3.0		1
4.0	Soft Sandy Silty Clay	5
5.0		3
6.0	Dark Gray Sandy Silt	3
7.0		3
8.0	Spring Termination Water Table	

Note: of blow, 140 lb. hammer, 30 in. fall, required to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.



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**MAIN OFFICE & LABORATORIES  
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RICHMOND, VIRGINIA**

Report No. **W-4637-3**

## TEST BORING LOG

Made for **Malcolm Firth Engineers**

Project: Proposed Diamond Creek Dam

Location: 1 Mile North of Route 60 at Missoud Creek

All borings are plotted to scale of 1 in. = 6 ft. using \_\_\_\_\_ as a fixed datum

No. 24

No. \_\_\_\_\_

No. \_\_\_\_\_

Elevation 15.9  
 14. 6.36 14. 11.07

Elevation \_\_\_\_\_

Elevation \_\_\_\_\_

Depth	Soil Status	Blows
0.0	Topsoil	
1.0	Soft White Sand	9
11.0	Soft White Sand, Spots of Clay	12
12.0	Dark Gray Silty Sand	14
20.0	Boring Terminates Water Table Not Reached	10

[illegible][illegible]

number of blows, 140 lb. hammer, 30 in. fall, required to drive 2 in. O.D., 1.375 in. I.D. Sampler one foot.

## APPENDIX V

### REFERENCES

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3. "Rainfall Frequency Atlas of the United States," Technical Paper No. 40, (U. S. Weather Bureau, May 1961).
4. "Recommended Guidelines for Safety Inspection of Dams," Office of the Chief of Engineers, Department of the Army, Washington, D. C.